Chemical Week

August 30, 1952

Price 35 cents

Polyethylene output, already double last year's, heads for another three-fold increase . p. 10

Contract packagers savor boom as chemical makers drive for retail sales . . . . . p. 23

Three companies will bet $33 million on new ammonia process; planned output: 190,000 tons. p. 28

Electrochemical hormones? Here's research problems and promise . . . . . p. 37

Unshackled oleo grabs lusty share of bread-spread business, revamps chemical market . . . . . p. 45

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Chemical Week

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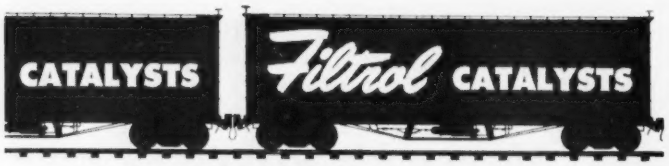

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OPINION . . .

Kilowatts and Tons

To the Editor: . . . I have found the report "Phosphorus: Shifting, Growing, Changing" by Dr. Joseph Gordon (Aug. 2) most interesting. The author has gathered much information on our phosphorus industry, presented it in a very readable form. . . .

There is only one criticism I would like to make: In the table (page 28) "Elemental Phosphorus Producers and their Capacity" . . . the author has failed to distinguish between furnace capacities as expressed in kilowatts and in tons of phosphorus produced per year. . . . It would undoubtedly be worthwhile to check some of these figures. . . .

Christian H. Aall
Asst. Research Director
Phosphate Division
Monsanto Chemical Co.
Anniston, Ala.

To the Editor: . . . Your CW Report on phosphorus is certainly one of the most comprehensive reviews of the industry that has been written. . . .

Robert H. Kean
Asst. Research Director
Virginia-Carolina Chemical Corp.
Richmond, Va.

The Long Green

To the Editor: I got a kick out of your editorial (Aug. 16) on chlorophyll. Am working on my first tube of the green stuff . . . but think I'll go back to the old original.

Certainly the television stations and tooth brush manufacturers must be reaping a harvest from this craze. . . .

C. E. Trott
Miami, Fla.

Proper Recognition

To the Editor: . . . The picture on your cover (July 26) showed two of our men working on an aniline press . . . but you failed to give us proper recognition. . . .

Re the accompanying news article which was written about polyethylene and the problems which came about because of certain properties in its manufacture are well known to us, as we worked on this problem right from the start.

In fact, we were the first to produce an aniline ink which would print successfully on the film. It is true, that the ink was not perfect but it was accepted. . . .

You mention only one ink firm in your article. Not being boastful, I

would like to mention . . . that our firm is noted as the world's largest producers of aniline ink and are fortunate in holding good reputation throughout the converting industry.

S. W. Haug
Advertising Manager
Bensing Bros. and Deeney Sales Co.
Philadelphia, Pa.

CW regrets the oversight in not crediting the picture. Our news story was not, of course, primarily on aniline inks but on processes used to condition the film for printing.—Ed.

Safeguards Observed

To the Editor: I am curious to know the incidence of mercury poisoning at the Mt. Jackson-Great Eastern Mine at Guerneville, Calif.

I had always understood that exposure to mercury vapor was extremely hazardous, so you can imagine my amazement at pictures (4,5,6 and 7, pp. 52-53, Aug. 9) which show no apparent effort to protect the operator or by-stander from mercury vapors. The place must reek with mercury fumes from spilled mercury. Your comments are invited.

B. L. Souther
Chemist
1421 S. Rolling Road
Relay 27, Md.

More meaningful than our comments might be, Reader Souther, are those of Sonoma Quicksilver Mines, Inc., operator of the facility in question, whom we queried. The firm says: Until the final separation step, the mercury is handled either under water or in a water-mud-mercury mixture. Huge fans over the trays collect all vapors. Respirators are used whenever there is any danger of vapor poisoning. But the main cause of poisoning is hand-to-mouth contamination. Gloves must be worn, hands must be washed thoroughly, and no smoking or eating is allowed in the plant proper. True, some of these precautions were temporarily laid aside for the cameraman who, justifiably or not, values art above safety.—Ed.

CW welcomes expressions of opinion from readers. The only requirements: that they be pertinent, as brief as possible.

Address all correspondence to: W. A. Jordan, Chemical Week, 330 W. 42nd St., New York 36, N.Y.

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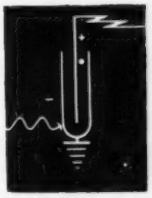
ELECTRICITY  FROM RADIOACTIVITY

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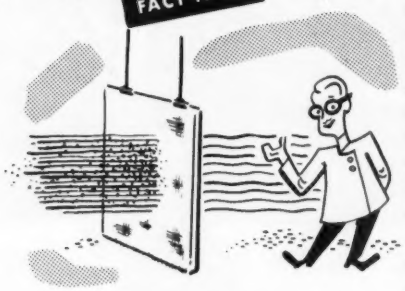

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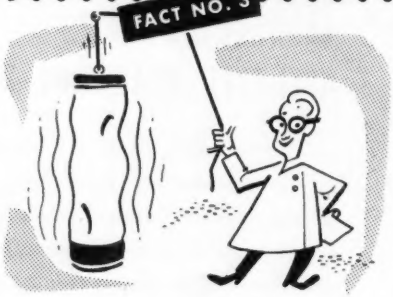

BAG SHAKING ACTION is the most efficient method of cleaning the filter and does not reduce the collection efficiency.

FACT NO. 4

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NEWSLETTER

On the high seas this week and approaching Madras, India is the 30,000 tons of ammonium sulfate bought by GSA from Comptoir Belge de L'Azote Cobelaz. The origin of the material—whether or not it came from the Soviet's Leuna works—has been in dispute for some weeks. (CW, Aug. 9).

Now the U. S. government has examined certificates from the six Belgium and one French plant which produced it. One unusual aspect: it's packed in jute bags. Why: the packing is a fillip to jute-conscious India, which is feasible, says GSA, because the "acidity neutral" of the sulfate rates at a tolerable 0.3.

Not coke-oven ammonium sulfate but synthetic ammonia is the goal of a California firm which has just filed incorporation papers calling for 500,000 shares at $10 per. CMP and DPA certificates have been filed and a 25-acre site selected at Oleander, Cal. (in California's agricultural heartland).

Ammonia Chemical's goal: a 100 ton a day plant by Feb., 1954.

Synthetic textiles and plastics made news this week too. And two textile promoters took poles-apart tacks.

Chemstrand, with fanfare and razzle-dazzle promotion, launched its new fiber Acrilan. But one item due to get prominent billing—blankets woven by Pepperell—got an unconventional-for-new-product introduction. They won't shrink, of course, but they're admittedly no warmer, no cheaper than wool. The main sales appeal: to the curious who hanker to buy anything new, different.

Macy's, on the other hand, tootled the more familiar new product refrain in selling its first offering of perlon hosiery (made from yarn imported from Denmark). The theme: silkier, longer-wearing, more snag-resistant—and more expensive—than nylon.

That raised eyebrows and ire in textile circles, stands as the first joust between two fibers which may well battle head-on before many years pass.

Plastics inched up another notch in a couple of quarters. Already under development by the Navy for shipping boxes, and specified in some contracts by the Air Force, fiber glass-reinforced containers now have been tagged for bomb sight shipment. RFC has just loaned $30,000 to Reinforced Plastics Corp. (Vineyard Haven, Mass.) to help finance their manufacture.

Plastic film got a Washington nod too. Said USDA researchers: film-lined fiberboard cartons reduce wilting and softening of apples, prevent shrivelling and weight loss in citrus fruits.

Just how big is our stake in atomic energy projects? That's one question that's never categorically answered. But this week the AEC let a few new facts slip out from behind the security curtain.

With a vast new expansion still in its initial stage (Congress

OK'd another $3 billion for new plants at the past session) AEC already:

- Accounts for 5% of nation's spending on construction
- Uses 2% of nation's available electricity
- Consumes 5% of U. S. sulfur output
- Employs 10% of nation's physicists, 2% of the engineers

That's today, but you can calculate what's ahead. More men, more chemicals, more equipment, will be funnelled into AEC projects.

Makers of agricultural chemicals can look for larger markets as a result of the Sixth International Grasslands Congress, held last week on the Pennsylvania State College campus.

Experts pointed out that insects and weeds are taking heavy toll of forage and pasture lands the world over. Insect control, they said, usually requires a combination of two insecticides applied several times during the season; and chemical weed control—when other measures are not effective—is one aspect of good farming.

Taking advantage of home gardeners' new chemicals-consciousness, American Cyanamid is now introducing its Aero brand of calcium cyanamide to that market as a combination herbicide-fertilizer.

Long used by commercial farmers, the material kills all seeds in the soil when first applied. Thereafter it gradually hydrolyzes, releasing lime and nitrogen, thus fertilizing the bed before seeding.

Of further interest to fertilizer makers is a book-length report by a visiting British productivity team, comparing U. S. and British superphosphate and compound fertilizer production methods. The factors causing productivity differences are also applicable to other chemical process industries; hence the report is of broad-gauge significance.

It's available from the Office of Technical Services, U. S. Department of Commerce, Washington 25, D. C. (PB 106,442; 75¢).

Here's a slick way of getting into research; Public Law 557, passed by the last Congress, allows the three military departments to build whatever special research or test facilities and equipment they need and turn them over to the research contractor for his own use without compensation to the government. The property can also be leased, loaned or sold to the contractor at fair value.

The military agencies asked for the law to make it easier to carry out "one of a kind" projects where special facilities are required. The law thus withholds this kind of help for general-purpose research facilities.

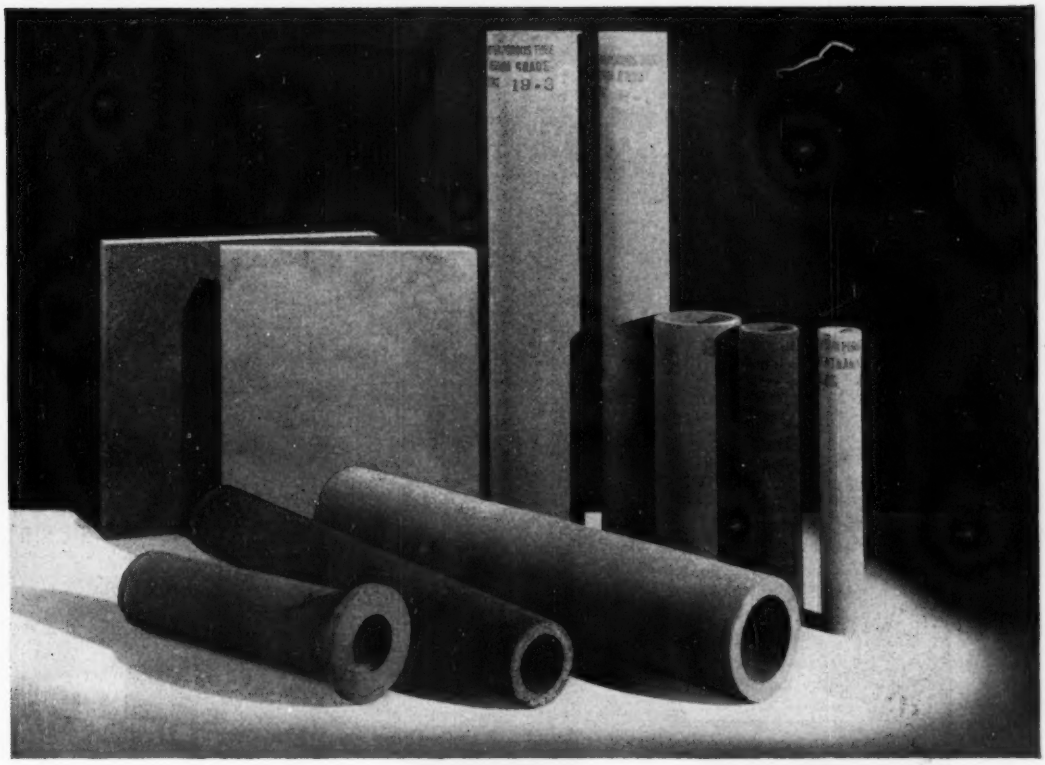
Sulfur dichloride is the key to a new process, developed by Armour Research Foundation for decalcomania-making Meyercord Co. (Chicago), to speed the drying of various inks, paints and varnishes.

Currently used decal inks take hours to harden; two to twenty seconds suffices with the new method—which simply consists of exposing the treated sheets to sulfur dichloride vapor.

Other firms will be able to use the process by means of licenses under U. S. and foreign patents.

Chemical process industries will have a hand in making U. S. military men "knights in armor." The armed services plan to standardize on a single type of body armor combining the advantages of the Marines rigid glass fiber plates, curved to fit the body—now in quantity production —and the Army's spot-laminated 12-ply nylon duck—still experimental.

. . . The Editors



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GC52-5

BUSINESS & INDUSTRY . . . . .

SELLING CHEM CAREERS: How much talent can be mustered in the schools?*

Wooing the Scholars

Chemical companies this coming year will be developing "TV personalities"—handsome people with golden voice, stage presence and a friendly, sincere manner that appeals to youngsters. Function of these orators will be not to charm the stockholders at the annual meeting, or to smooth-talk the hired hands out of a strike, but to carry out a newly announced program of the Manufacturing Chemists Association: to get more young people enthusiastic about chemical careers.

Deficit in Technicians: The chemical industry in the U.S., already hampered by a shortage of chemists and chemical engineers, will run into real trouble in this respect in the near future, MCA predicts. It quotes these figures from the report of a recent manpower conference at New York University:

In 1953 and 1954, the nation's colleges and industries will graduate just 17,000 engineers each year—but industry will need 30,000 such personnel next year and 36,000 the year after.

"For the next five to seven years," that report warns, "industry's requirements for engineers and technically trained personnel will so far exceed the available supply that a complete re-evaluation must be made of the work in which these specialists are currently engaged." In other words, a chemical engineer now on a sales staff may have to be shunted back to the production department.

Recruiting Drive: Noting that the chemical industry's technical force should keep pace with the industry's anticipated three-fold increase in sales volume by 1975, MCA Board Chairman William H. Ward declares:

"How far the nation can proceed in medicine, crop production, atomic energy and other vital fields will depend greatly on how much scientific talent can be mustered in the schools."

Accordingly, MCA is calling on all chemical companies in the country to carry this drive to high school students, their teachers and their parents. Techniques for informing prospective young scientists about career opportunities in industrial chemistry and chemical engineering include:

• Taking students on guided tours through chemical plants. ("Provide for some form of group participation. Let students operate a simple piece of equipment, or give them souvenir end-products.")

• Classroom talks by company representatives. ("Use training aids—films, charts, working models, sample materials—and be realistic.")

• Personal interviews with individual students. ("Friendly relationships can be built up and the student's career genuinely guided and assisted.")

• Summer or part-time employment. ("'Earn-learn' programs should be regarded as an investment in vocational guidance rather than as a means of filling immediate personnel requirements.")

For chemical companies that take part in this "cumulative effort at the neighborhood level to persuade capable students to continue their training for chemical degrees," this will be another venture in community and professional service, and a vitally needed contribution to and investment in the future of the companies and their industry.

* Members of MCA's Student Guidance Committee, left to right: E. F. du Pont, of E. I. du Pont de Nemours & Co.; Robert L. Taylor, Hill and Knowlton, Inc.; W. Austin Bishop, chairman, Pennsylvania Salt Mfg. Co.; T. C. Fetherston, Union Carbide & Carbon Corp.; and John J. Healy, Monsanto Chemical Co.

Petition Frenzy

Agents for a New York company have obtained zoning approval on a plot of land north of Memphis, Tenn., on which the company could construct its $20 million ammonia-urea plant. The approval came only after a rather bitter battle before the county planning commission. The words "fertilizer plant" were anathema to nearby residents, who associated the term with fumes and dusts.

The location now made available is in the Woodstock area of the city, on Illinois Central trackage near the Du Pont peroxide plant and immediately adjacent to facilities operated by Montana Ferroalloys.

The board gave as its reason for overriding the objections that the process scheduled to be used would not cause odors, dust, smoke or noise. Protestors, however, were not satisfied. One called the whole hearing a "cut and dried affair." Brandishing a list of 200-plus names, he threatened: "Beware you do not betray these people." Several persons, he said, had contributed $50 apiece toward financing a possible court action.

Checkered Cracker

Local opposition has caused a change in plans for Florida Petrochemical, which has been planning to erect oil cracking facilities at Fort Lauderdale. The delay was long enough to lose the company its 10-year contract to supply Pennsylvania Industrial Chemical Co. with cracking products. Picco, instead, will get the raw materials it

wanted by enlarging its own cracking facilities at Chester, Pa.

In addition, Picco has withdrawn from the Florida company, in which it had owned a large interest. Thus Florida Petrochemical also will not be able to use the Ugite cracking process, rights to which are owned by Picco.

Tourists, not Industry: Main point brought up by the opposition—the local newspaper, some hotel and apartment owners—was that of pollution. They envisioned the plant as a producer of wastes and smells which would drive away the tourist traffic.

A company official rebutted this way: "This is 1952, not 1902, and the idea that all industry [in southern Florida] is automatically undesirable is rather out of date . . ."

When the opposition first became known, a fact-finding board was set up. The board voted 11-1 in favor of the plant. Opponents remained adamant; they circulated petitions asking for a county-wide referendum, and, in addition, threatened to go to court.

Help, not Hindrance: The county port authority, despite the opposition, remains willing to lease Florida Petrochemical the land it wants for a plant. But any future plans will be considerably changed:

Bunker oil, not crude, will be cracked. While the main product would still be gas for Florida consumers, chemicals (e.g., benzene, toluene) must bring in a significant part of the revenue. Asphalts and tars would also be a large product.

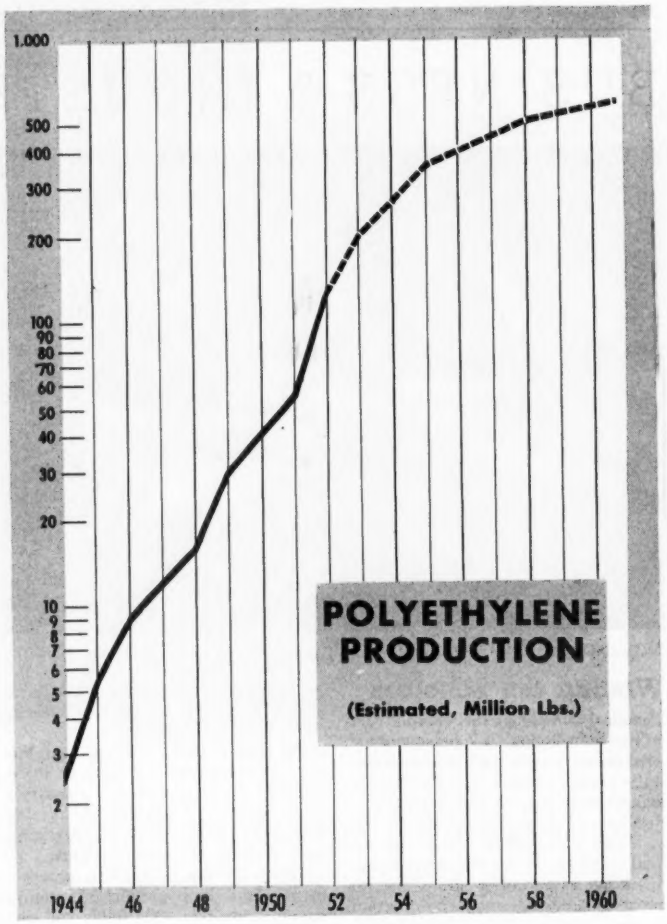
In any case, there is at least one bright note: A Ugite plant would cost about $6 million, while the tab on this plant might not exceed $4 million.

LEGAL . . . . . .

Chemical Link?: Vick Chemical, New York, and Colgate-Palmolive-Peet, Jersey City, are accused by the Federal Trade Commission of violating the Clayton Act, which forbids interlocking directorships among large competing companies. FTC says it's unlawful for William R. Basset to be a member of both boards at the same time. Hearing on this complaint will be held Oct. 21 in Washington.

•

Native Guards: Because of a quirk in the state law and a shortage of local applicants, the new atomic energy plant at Paducah, Ky., may have trouble in hiring a full complement of plant police. The law permits Kentucky employers to hire special peace officers, but specifies that such officers must have lived in the county where employed for at least two years.



The Push for Poly

Polyethylene's exit from NPA's allocation list highlights expanded production of this versatile plastic.

Production has about doubled during past year; now runs at 125 million pounds per year; should hit 350 million by 1955.

Two producers have a headstart, but others may elbow into the field when patent situation changes.

Polyethylene, which has perennially been in short supply during its 10-year existence, and which was under formal allocation during both World War II and the defense build-up of the past few months, has finally surged out on the market in ample supply.

During the year, producers have approximately doubled capacity, and have in various planning stages further capacity that, by 1955, would again triple production of the polymer.

In many ways, this production boost is a paradox. Polyethylene is hellishly difficult to make. Production of the high-molecular-weight material—the only real volume item—takes reaction pressures of more than 1,000 atmospheres. The reaction is one of the most exothermic known. Ethylene raw material must be virtually untainted with anything else—especially acetylene.

Nevertheless, many plastics men

believe that it soon will become the world's most important plastic, volume-wise. In any case, for a plastic which was first produced about a decade ago, the present 120-125-million pound/year output is a lusty jump.

The Beginnings: First U.S. production plant was Du Pont's facility at Belle, W. Va. This was patterned along the lines of ICI's British plant. (Du Pont is licensed under ICI's patents.)

Union Carbide was second to enter the field, producing material at Charleston, W. Va., to meet Navy specifications. It is a sublicensee of Du Pont under ICI's basic patents, but, reportedly, uses its own process.

During the first years, 100% of production went into war uses, mainly for radar and other electrical applications. From these early installations and uses, there has been significant diversification.

Du Pont in 1949 put polyethylene into production at Orange, Tex., and soon after, ended commercial production at Belle. Carbide, while still producing at Charleston, also has been making the plastic at Texas City. It plans to start production later on at two additional locations: Seadrift, Texas, and Torrance, Calif. Seadrift is scheduled onstream in mid-1953 (as is another Du Pont unit at Orange), while the West Coast facilities will come in by the end of 1954.

In many ways, the Pacific unit is the most interesting. Carbide believes that the Western area someday will be able to use all of the 50-60 million pounds of PE which it plans to produce there. It feels that, until that time, it will be able to ship the product east and still price it competitively. Also, Carbide is partially banking on a "clannish" sentiment among West Coast manufacturers. Given a choice, West Coast users will buy "made in California" goods.

There is also the point that many paper products, irrigation projects, and vegetable and fruit raising are concentrated on the Western slope. All of these are ultimate PE consumers.

The Uses: There are probably six major fields in which high molecular weight polyethylene will compete. These are packaging film, bottles and jars, injection molded products, cable, wire and electrical use, large diameter piping (for such uses as irrigation) and as coatings for metal, fiber drums and the like.

Speaking of the first four, one PE molder gives this usage breakdown: film, 33-35%; bottles, 20%; injection molding, 18-20% and cable, 25%. This is not a true distribution at present, he says, but may be the pattern by, say, 1958.

Another man, looking ahead to 1955, forecasts things this way: paper and metal coatings, 34%; cable and electrical uses, 18%; film, 36%; bottles and jars 16% and pipe, 8%. Injection moldings would come to 8%.

All of these figures consider only the high-weight material; the low molecular weight polyethylene would find main use as a wax additive, and in some coating applications.

Future Contenders: Presently, Kodak's Texas Eastman subsidiary and Allied Chemical and Dye are planing to make this material, which apparently is not covered by ICI-Du Pont patents.

Of course, they would be natural contenders in the high-weight field if and when the basic patents expire (starting in 1956) or are made available under court-sponsored licensing.

At least 10 other companies have done some laboratory work on the plastic, but whether all would "want in" the field is debatable. It would take 2-3 years and $20 million to build a plant, let alone to get the engineering experience needed for successful operation.

And Du Pont and Carbide have a long headstart.

LABOR

Sudden Strikes: Ohio and Kentucky have the week's biggest strikes on their hands, with nearly 16,000 rubber workers mad at Goodrich and about the same number of construction workers angry with contractors at the atomic energy plant at Paducah.

- In Ohio, the United Rubber Workers (CIO) have been zig-zagging through negotiations with major rubber companies for more than two months, and had nailed down dime-an-hour wage-boosting contracts with Goodyear, U. S. Rubber, General Tire and Seiberling. Goodrich agreed to stick to that same wage pattern, but in discord over other terms, the union bargaining committee abruptly ordered the strike against nine Goodrich plants.
- At Paducah, where unruly unionism has been hashing up the new AEC plant's construction schedule

CHEMICAL COMPANY EARNINGS—First Six Months

(000 omitted)

	Total Sales		Pre Tax Earnings		Taxes				Net Earnings			2nd Quarter Net	
	1952	1951	1952	1951	1952	%	1951	%	1952	1951	% Chg.	1952	1951
Air Reduction	63,081	58,231	9,078	9,748	5,190	57.2	6,369	65.3	3,888	3,379[1]	+15.1	1,936	1,676
Allied Chem. & Dye	244,326	254,692	43,993	58,059	23,359	53.1	37,616	64.8	20,634	20,443	+ 0.9	10,819	10,230
American Agric. Chem.	35,024	33,733	5,726	5,859	2,850	49.8	2,950	50.3	2,876	2,909	— 1.1	1,758	1,744
American Cyanamid	183,259	200,915	26,056	51,455[2]	14,000	53.7	28,700	55.8	12,056	22,755	—47.0	5,420	13,219
Atlas Powder	25,627	26,009	1,918	3,167	1,028	53.6	1,998	63.1	890	1,169	—23.9	461	633
Commercial Solvents	21,606	32,093	189	7,265	23	12.2	4,158	57.2	167	3,108	—94.6	—27	1,489
Davison Chemical	Not Yet Available												
Diamond Alkali	38,738	38,959	5,823	9,749	2,875	49.4	6,337	65.0	2,948	3,412	—13.6	1,301	1,754
Dow Chemical[3]	206,834	185,306	49,781	69,154	31,248	62.8	48,763	70.5	18,533	20,391	— 9.1	10,112	11,427
Du Pont[4]	759,255	769,989	284,808	294,822	183,100	64.3	176,420	59.8	101,708	118,402	—14.1	50,895	58,844
Hercules Powder	91,724	110,672	18,433	21,952	12,551	68.1	15,367	70.0	5,883	6,585	—10.6	2,822	3,220
Heyden Chemical	10,662	15,767	1,400	3,638	763	54.5	2,157	59.3	637	1,481	—57.0	181	721
Hooker Electrochemical[5]	18,782	19,974	4,909	5,734	3,340	68.0	3,774	65.8	1,569	1,960	—19.9	896	936
Int. Min. & Chem.	52,724	41,142							4,950	4,718	+ 4.9	2,628	2,452
Mathieson Chemical	61,000	47,416	10,478	12,774	4,960	47.0	7,205	56.4	5,518	5,569	— 0.9	2,910	2,662
Monsanto Chemical	126,329	139,743	20,427	34,277	10,326	50.6	22,182	64.7	11,101	11,304	— 0.2	5,712	5,691
Newport Industries	8,167	12,255	764	3,062	210	27.4	1,843	60.2	554	1,219	—54.6	168	595
Nopco Chemical	8,936	12,450	1,126	2,073	744	66.1	1,415	68.3	383	658	—41.8	166	284
Penn. Salt Mfg.	29,281	25,191	3,915	6,551	2,281	58.3	4,183	63.9	1,634	2,486	—34.3	710	1,185
Pittsburgh Coke & Chem.	19,717	24,937	2,329	5,260	1,333	57.2	3,626	68.9	996	1,634	—39.0	260	836
Rohm & Haas	52,712	58,972	7,702	13,466	5,149	66.9	9,426	70.0	2,553	4,040	—36.8	1,261	2,021
Union Carbide & Carbon	452,875	458,308	115,277	140,994	68,837	59.7	82,766	58.7	46,440	58,228	—20.3	23,060	29,049
Victor Chemical Works	16,894	16,779	2,792	4,209	1,554	55.7	2,707	64.3	1,239	1,502	—17.5	611	727
Virginia-Carolina Chem.	54,164	59,528	6,861	8,835	3,636	53.0	4,615	52.2	3,224	4,220	—23.6	1,696	2,045
21—Company Total	1,925,993	2,601,919	623,785	772,103	379,357	60.8	474,577	61.4	245,431	296,854	—17.4	123,068	150,988
Total—excluding Du Pont	1,766,738	1,831,930	338,977	477,281	196,257	57.9	298,157	62.4	143,723	178,452	—19.5	72,173	92,144
Du Pont as % of Total	39.4	29.6	45.7	38.2	41.7		37.2		41.4	39.9		41.4	39.0

[1] Excludes $494,703 gain from investment sale and miscellaneous income. [2] Includes $5.8 million non-recurring dividend. [3] Six months ending May 31. [4] Six-month $40 million GM dividend included in all but "total sales" figures.

month after month, it appeared a couple of weeks ago that the labor situation was about to simmer down, as WSB approved payment of more than $1.6 million in retroactive pay rises for some 11,000 AFL laborers. Suddenly, in mid-August, about 3,000 pipefitters walked off the job because of an internal union dispute. Three days later, the pipefitters went back to work and all but 2,000 of the 18,000 laborers walked out. Said AEC's deputy manager at Paducah: "We don't even know what they want."

•

Thrust and Parry: Jousting between chemical companies and unions last week included these slashes and jabs: Thompson-Haywood Chemical of New Orleans went to court and got an injunction to keep officers and members of United Mine Workers' District 50 from picketing the plant . . . CIO filed an unfair labor practice charge against Mathieson Chemical for laying off 62 workers at its plant near Brandenburg, Ky.; CIO claims the layoffs were intended to influence a bargaining election at the plant . . . The AFL Firemen & Oilers' union won a bargaining election at Mathieson's plant at Doe Run, Ky., with 81 workers voting for the victorious union, 42 for the CIO Oil Workers, 29 for "no union," and the other 29 not voting . . . Some 400 AFL Chemical Workers struck the Rensselaer (N.Y.) dye-making plant of General Aniline & Film, demanding a pay rise of about 5½¢ an hour, while the company points to "the depressed condition of the textile industry" as support for its inability-to-pay argument.

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Love and Kisses: Elsewhere, the chemical industry is enjoying newly attained peace and harmony in labor relations. Most moving reconciliation story of the week came from Buffalo, N. Y., where about 150 members of United Steelworkers (CIO) went back to work at Electro Refractories after a one-week strike during which they enjoyed a picnic with their bosses. Management provided food and entertainment for the picnic, and after this fraternization, the two parties agreed on a settlement with a 13-cent compromise wage increase. Commented Steelworker staff representative Walter J. Payne: "I've never seen such a friendly strike—it was extraordinary."

• Boyle-Midway, Chamblee, Ga.—17 revisions in new contract with United Gas, Coke & Chemical Workers (CIO), including wage increases of up to 35¢ an hour.

• Electro Metallurgical, Ashtabula, Ohio—new two-year pact with United Steelworkers provides for pay rises ranging up to 22½¢ an hour, with 8½¢ of this increase subject to WSB approval.

• Glidden paint division, Cleveland—Women employees now have their own seniority list under new contract with automatic semi-annual wage increases plus an immediate 4¢ hike pending WSB ratification.

• Richard Hudnut, New York—With the help of the American Arbitration Association, a new contract with Gas-Coke was hammered out to provide a 6¢ hourly pay rise and additional health and welfare benefits.

• Johns-Manville, Marrero, La.—Sixteen conferences between company and Gas-Coke union officials led to a new contract with a 6% wage increase and settlement of disputes over transfer of workers and promotion of maintenance men.

• Michigan Limestone & Chemical, Buffalo, N. Y.—New two-year contract with the AFL Grain Millers includes a 17¢ hourly wage increase, retroactive to March 1, six paid holidays, shift differentials of 6¢ and 9¢, and three-week vacations after 15 years of service.

• Standard Oil (Ind.) announced liberalized employee benefit plans for all employees, including 12,000 engaged in refining and petrochemical work. The plans include retirement annuity, hospital and surgical, and injury or disease compensation.

• Tidewater oil refinery, Avon, Calif.—WSB has approved wage increases ranging up to 15¢ an hour and a $284.50 monthly minimum wage for mass spectrometer calculators. The new agreement with Oil Workers International Union (CIO) makes wage boosts effective as of April 1.

COMPANIES . . . .

Money—that was the company news keynote this week. Four companies planned to raise $167 million via public and private financing.

• B. F. Goodrich has sold $20 million worth of 3.25% promissory notes, due in 25 years. Buyers were private investors.

• Standard Oil of Indiana is considering allowing its stockholders to buy $139 million worth of convertible debentures. It will use the money to pay back $81.5 million in bank loans and for further expansion.

• Pittsburgh Coke & Chemical sold $5 million worth of 3.5% notes to two New York banks. Maturity dates run from July, 1953 to 1957.

• Texas City Chemical last week marketed $3 million worth of 5.25% subordinate sinking fund debentures and 300,000 shares of common stock.

EXPANSION. . . .

Sulfur: Standard of Indiana has begun production of sulfur from waste sulfide gas at its Whiting, Ind., refinery. Capacity: 55 tons/day.

• Sulphur Converting Corp. momently expects to begin construction on its $4 million sulfur-from-pyrites plant at Roberval, Que. It will use the European sulfidin process on ores from the Chibougamau area of Quebec.

•

Alumina/Ammonium Sulfate: Filtrol Corp. plans to start construction in October on a $5 million plant to recover alumina and ammonium sulfate from waste acidic liquor from its present facilities at Vernon, Cal. It will use the alumina in its own catalyst manufacture. Shell will market the sulfate.

•

Petroleum Aromatics: Two producers are planning new oil cracking and polymerizing units for the Pacific coast:

• Standard of California will spend $20 million on a cat cracker at El Segundo, Cal. Throughput will be 36,000 bbls./day, though its feed stock preparation unit will be able to handle 54,000 barrels daily. Construction will begin in mid 1953, with completion slated for 1954.

Cal Standard also plans to build a unit at El Segundo next year to make cumene from benzene and propylene.

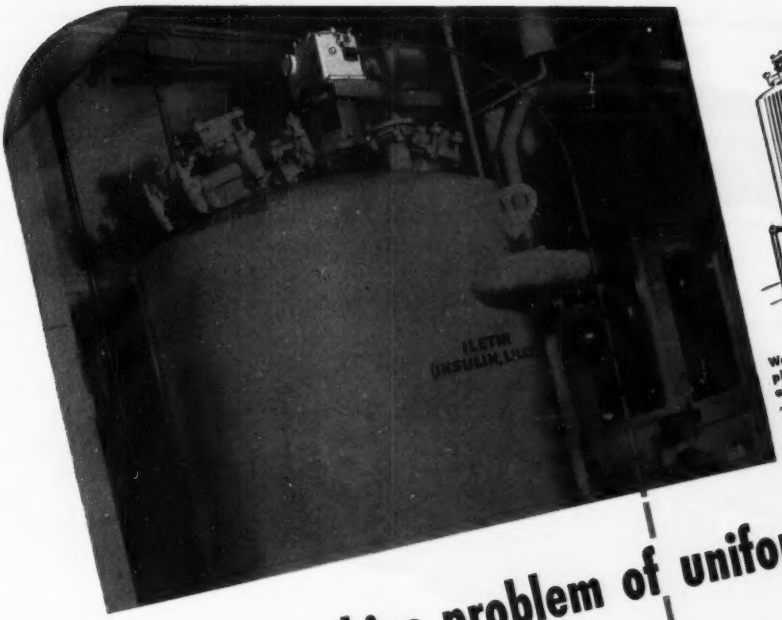
• Shell Oil of Canada will expand its Vancouver, B.C., refinery. It will shell out $10 million to double the present cracking and refining facilities so that 15,000 barrels of oil can be handled daily.

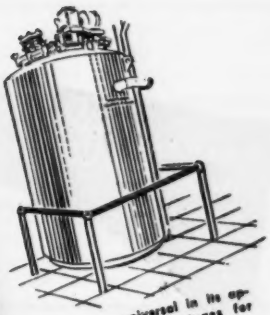
•

Manganese Dioxide: American Metallic Chemicals has begun production of electrolytic manganese dioxide at its new Portland, Ore., plant.

CURRENT LIST OF DPA-CERTIFIED FACILITIES

Company, Location	Product	Amount Certified	% Certified
Union Carbide, Institute, W. Va.	Ethyl acrylate, ammonium sulfate	$ 476,000	45
Great Southern Chemical, Corpus Christi, Tex.	Butylene concentrates	2,095,095	65
		719,452	40
		81,568	15
Bristol Laboratories, East Syracuse, N. Y.	Antibiotics	9,203,766	50
American Cyanamid, Pearl River, N. Y.	Antibiotics	5,280,000	45
Chas. Pfizer, Long Island, N. Y.	Antibiotics	4,850,000	50
Merck & Co., Danville, Pa.	Antibiotics	1,292,000	50





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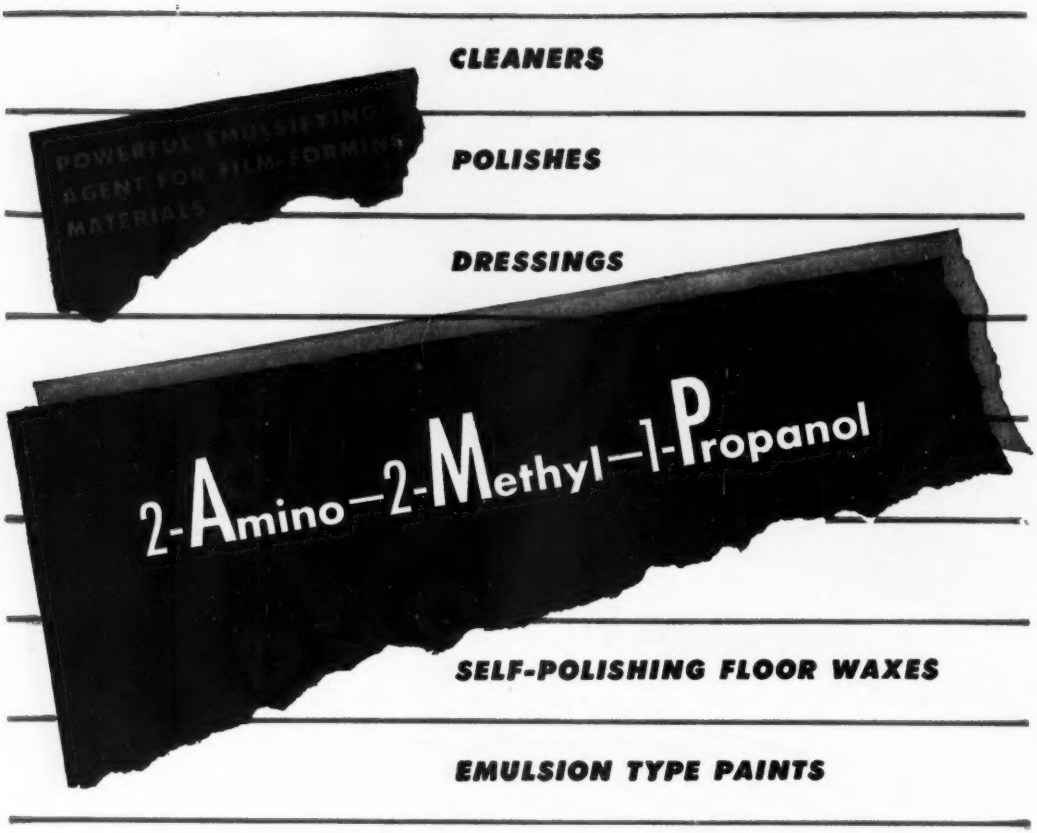

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Boiling Point, °C	165 at 760mm
Specific Gravity	0.934 at 20/20°C
pH at 20°C of 0.1M Solution	11.3
Vapor Pressure at 20°C	approx. 1mm
Flash Point (Tag. open cup)	159°F
Solubility in Water g/100 ml at 20°C	completely miscible
Index of Refraction at 20°C	1.449

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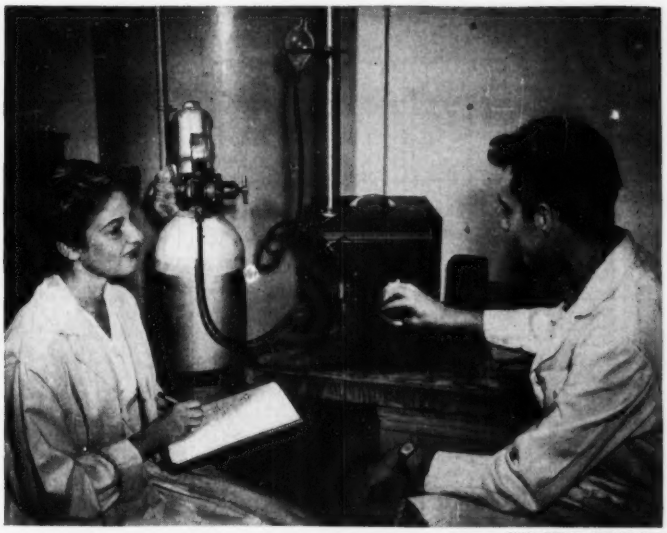

CHRIS GRUBB—MCGRAW-HILL

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Chemistry Cadets

Need someone who can run analyses, like Kjeldahls for nitrogen determination? How about a bright young lad who knows how to use A.S.T.M. standard methods, or who is well versed in routine organic reactions?

Each week, more of the industry is discovering a source of chemical talent that only a few companies were "on to" before.

Laboratory managers who'd like to recruit a few young people ready to go to work as lab technicians can find a limited supply of trained personnel on the employment market every June and February. These junior chemists are not mis-fits who have flunked out of medical or engineering courses; they are young people who have studied laboratory work for two years with the serious intention of becoming lab assistants.

Ten Chief Sources: At least ten institutions in North America are offering college-level courses leading to a two-year or three-year degree in chemical technology. Their graduates, ready to start working in a research or analytical laboratory, comprise a potentially valuable crop to be harvested by chemical companies' personnel managers.

Chem tech graduates are trained to carry out laboratory operations as directed by senior lab employees; for example, the lab director might call on his rookie assistant to perform an analysis by a certain standard method adopted by that company. As the lab assistant gains experience, he can be assigned to more advanced work.

Among the techniques that these chemical cadets learn are weighing with analytical balance, titration, distillation, filtration, instrumental analyses, and basic steps in industrial chemical production.

High Mortality Rate: Typical of the schools that offer chemical technology courses is the Institute of Applied Arts and Sciences at New York City, a division of the State University of New York. The S.U.N.Y. also operates ten other two-year technical institutes, and a similar course in chem tech is offered at its Canton, Farmingdale, Binghamton, Buffalo and White Plains branches.

The institute at New York City, housed in a six-story building in Brooklyn, is graced with some $85,000 worth of chemical laboratory equipment. It's the boast of department head Lewis R. Fibel that all this apparatus is the kind actually used in industry, untainted by school-house simplification. Among the instruments are Beckman spectrophotometer, Parr calorimeter, Fisher electropode, colorimeter, pH meter, titrimeter and electro-analyzer.

There's a high "mortality rate" at the Brooklyn institute. Dr. Fibel says that out of the approximately 60 students who are admitted each September and the 30 accepted each February, about one-third are weeded out during the two-year course.

Not All Test Tubes: The curriculum for chem tech students does not consist entirely of test tubes and reagents. Figuring that a lab assistant should be able to write clear, logical reports and possibly advance toward positions of administrative responsibility, the faculty has rounded out the program with subjects like English, writing and thinking techniques, effective speaking, industrial relations, American government, psychology and sociology. Students also get instruction both in physics and in mathematics.

At Purdue University in Lafayette, Ind., the two-year chem tech program includes technical report writing, industrial organization and production, and the economics of industry.

In Toronto, Canada, the Ryerson Institute of Technology gives its chem tech students instruction in business law, industrial legislation, and management problems in personnel, physical facilities, production, controls and marketing. At Franklin Technical Institute in Boston, the two-year course in industrial chemistry includes mechanical drafting, introduction to chemical engineering, and a series of visits to nearby chemical plants.

Three-Year Set-Up: One school is in the field with a three-year course in industrial chemistry, with this added feature: During the second and third years, the student spends part of his time working in chemical plants, learning the subject from the ground up.

This is the Rochester (N.Y.) Institute of Technology, a privately endowed educational center that has built much of its over-all program on the use of these "cooperative courses." Purpose of this plan, according to the institute, is to relate classroom training with industrial experience. Also these part-time jobs make higher education available to young people who

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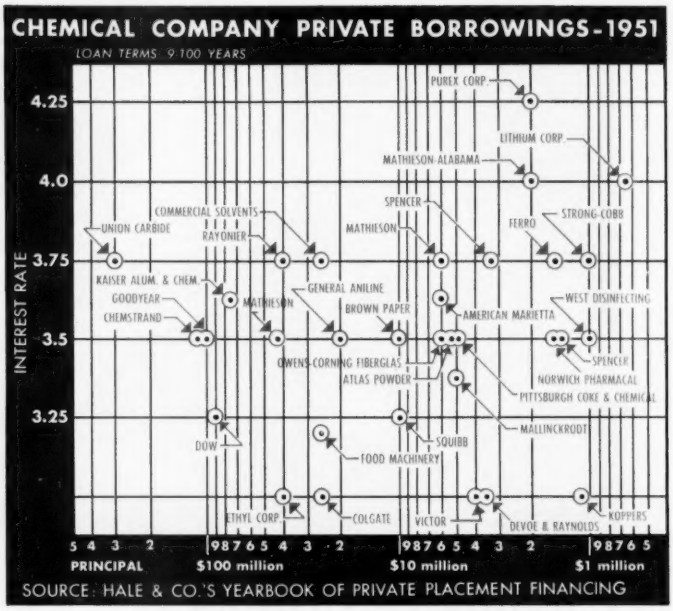

CHEMICAL COMPANIES are making increased use of private placement financing as a means of raising money for capital expenditures. This was forcefully brought out in the 1952 Yearbook of Private Placement Financing, published by E. V. Hale & Co., Chicago, which specializes in such industrial placements.

According to Hale's records, better than $5 billion changed hands in this way during 1951, and of this, $831,242,000 went to 33 chemical companies. CW herewith tabulates these loans of more than $600,000 for periods of 9 or more years. Only one loan was for over 26 years—Union Carbide's $300 million, 100-yr. borrowing.

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could not otherwise afford it.

Among the subjects in Rochester's industrial chemistry curriculum are general microbiology, strength of materials, and industrial management.

Success Stories: What happens to graduates of these chemical technology departments? Usually, they're snapped up by chemical companies shortly after graduation. Here are positions held by recent graduates of the school in Brooklyn, picked at random from the file of alumni records:

- Male graduate, 1952—chemical analyst, Stauffer Chemical, Chauncey, N.Y.
- Male graduate, 1950—laboratory assistant testing filament materials, General Electric, Bloomfield, N.J.
- Woman graduate, 1952—research assistant working on antibiotics, Chas. Pfizer, Brooklyn.
- Male graduate, 1951—lacquer and paint formulator, A. C. Horn division of Sun Chemical, Long Island City, N.Y.
- Woman graduate, 1951—laboratory assistant doing control work on permanent wave preparations, Nestle-Lemur Co., New York.
- Male graduate, 1951—started as operator, now shift foreman at Hatco Co. (napalm plant), Kearny, N.J.
- Male graduate, 1951—analyst testing new acrylic fibers, American Cyanamid, Stamford, Conn.
- Male graduate, 1952—entered University of Michigan as candidate for B.S. degree in chemistry.
- Three male graduates, 1952—junior chemists at G.E.'s Knolls Hill atomic energy plant near Schenectady, N.Y.

From this, it would seem that there's hardly a chemical plant on the continent that these chemical cadets couldn't fit into.

FOREIGN. . . . . .

Sulfur/Ecuador: Sulfur from the Tixan mines is now available for export, since production now is more than enough to supply local needs. Mineral exploitation rights are held by Chemical Plants Corp., New York.

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Silicones/Britain: Plans on the first silicone production in Britain have been changed. Silicone rubber—rather

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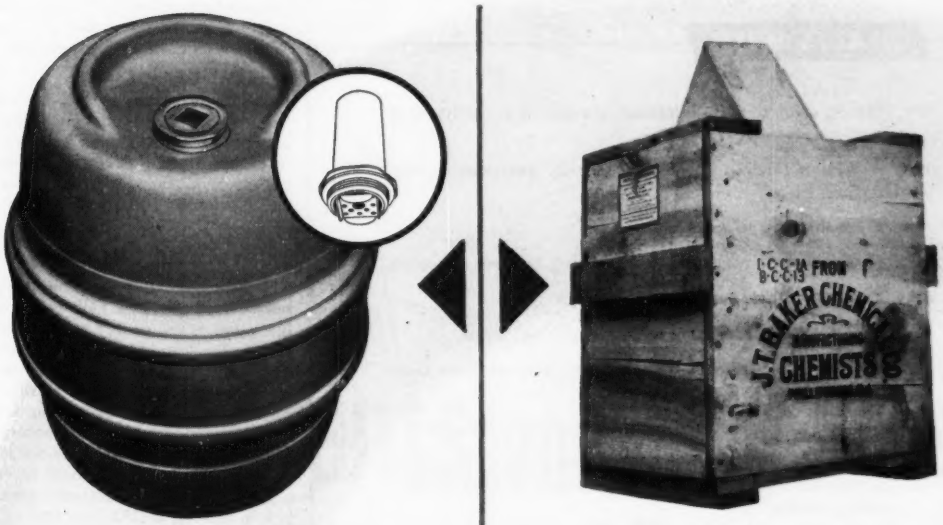


...STAINLESS STEEL DRUMS ...CONVENTIONAL GLASS CARBOYS

CHECK ALL THESE SAVINGS WITH STAINLESS STEEL DRUMS

1. Save approximately 30% in freight rates.
2. Save freight charges on 50 pounds tare each way—100 pounds in all.
3. Save storage space in both freight cars and in your warehouse. Drums may be stacked five high.
4. Save time and labor in trucking and handling. Drums can be rolled if necessary.
5. Do away with the possibility of breakage.
6. Save time in pouring. Stainless steel spouts make safe pouring easy.

Baker offers you dependable Nitric Acid Technical in five controlled strengths—36°—38°—40°—42°—43° Bé—each packaged in two types of containers... Glass Carboys and Stainless Steel Drums*.

SPECIFICATIONS
(All Grades)

Residue after Ignition	**0.005 %**
Heavy Metals (as Pb)	**0.0005%**
Iron (Fe)	**0.001 %**

When shipped in stainless steel drums you make many savings. You also have these safety features: There's no chance for breakage, and the stainless steel pouring spout** available with these drums eliminates possible splash.

The next time you need Nitric Acid Technical, buy Baker. Specify shipment in stainless steel drums. Their convenience, saving in time, money and storage space will convince you that they are the ideal containers for this widely used Acid.

J. T. Baker Chemical Co., *Executive Offices and Plant,* Phillipsburg, New Jersey.

*Drums are returnable for full credit.
**Spouts are available at $5.00, re-usable but non-returnable.

Baker CHEMICAL

Baker Chemicals

REAGENT • FINE • INDUSTRIAL

Nitrogen Division

Crystal Urea

REACTS WITH

- Strong acids to form salts that are readily hydrolyzed by water.
- Alkali metals to form substitution compounds, e.g. sodium urea.
- Hypochlorites to form hydrazine.
- Hydroxides or carbonates, on heating to form cyanates.
- Fuming sulfuric acid to form sulfamic acid.
- Mixed sulfuric and nitric acid to form nitrourea.
- Hydrogen peroxide to form a crystalline addition compound.
- Alcohols at elevated temperatures to form carbamates.
- Aldehydes to form alkylol derivatives or bis ureas. Many of these compounds may be polymerized to form thermosetting resins.
- Organic acids, or their esters, anhydrides or chlorides, to form acyl ureas.
- Amines to form alkyl or aryl derivatives of urea.
- Alkene oxides, such as ethylene oxide, to form alkylol ureas.
- Straight chain organic molecules to form complexes, thereby permitting sharp separation of these from aromatic, alicyclic or branched molecules.

ONE or more of these chemical properties of Crystal Urea may suggest to you new uses for this versatile chemical.

Crystal Urea is a high purity product manufactured in Nitrogen Division's modern synthetic ammonia plant at South Point, Ohio. It is available for immediate shipment in 100-pound moisture-proof multiwall bags. Write to the address below for complete information.

•

Formerly Sold by The Barrett Division—Now Sold by

Nitrogen Division
ALLIED CHEMICAL & DYE CORPORATION
40 RECTOR STREET, NEW YORK 6, N. Y.

than other types of silicones—are now the first to be produced there. The Midland Silicones, Ltd., plant at Barry will come into full production during 1953. Both locally made silicones, and material imported from Dow Corning here will be sold under the name, Silastomer.

•

Petroleum Aromatics/Spain: Cepsa will spend $6.3 million in enlarging its Teneriffe refinery between now and the end of 1954. It will use the platforming process as the key to its catalytic reforming of the oil. Foster Wheeler technicians are assisting.

•

Nylon/Switzerland: Holzverzuckerungs A.-G., Ems, is now manufacturing caprolactam monomer for its nylon 6 "Grilon" fiber. Previously, it imported the monomer for polymerization and spinning.

•

Lone Star Gang-Up

The Texas Rangers and the sheriff's posses haven't been called out yet, but other state, county and city officials in the Lone Star state have been mobilized in a threatened crack-down on fume-exuding chemical plants.

Top man in the air purification drive, and convener of high-level meetings on the subject this week, is Senator-designate Price Daniel, now serving out his term as state attorney-general before moving to Washington.

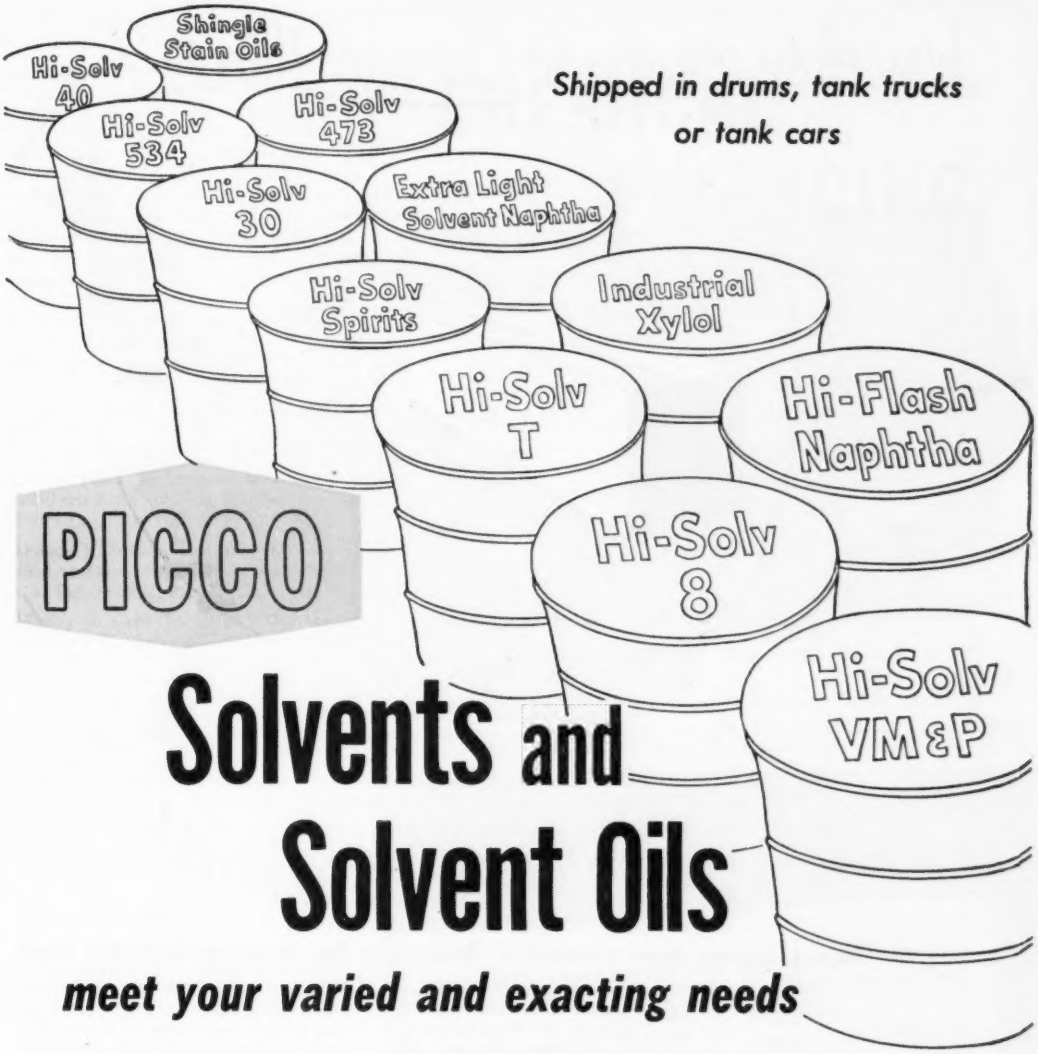
Daniel dove into the fracas last week with the announcement that he will turn his pack of state lawyers on Mathieson Chemical if that corporation doesn't comply with an ultimatum from the Harris county health director. Dr. L. D. Farragut had told Mathieson to stop alleged air pollution at its Pasadena plant by Aug. 25.

State Tries Persuasion: Meeting in Houston this week to discuss the air pollution problem will be businessmen from industrial plants along the Houston Ship Channel and officials of the State Health Department. Dr. George W. Cox, state health officer, says he hopes this meeting will work out plans for elimination of air pollution reasonably soon.

"We do not want to hurt the industries," Dr. Cox avers. "But if they do not cooperate, we will be forced to take the necessary steps to protect the people."

Speaking for Mathieson, Plant Manager John R. Beatty claims his company already has spent "large sums of money" for scrubbers and other devices that have reduced "substantially" the odors, fumes and dust emanating from the plant.

In Northern Texas, the Bonham city



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CLAIRTON, PENNSYLVANIA

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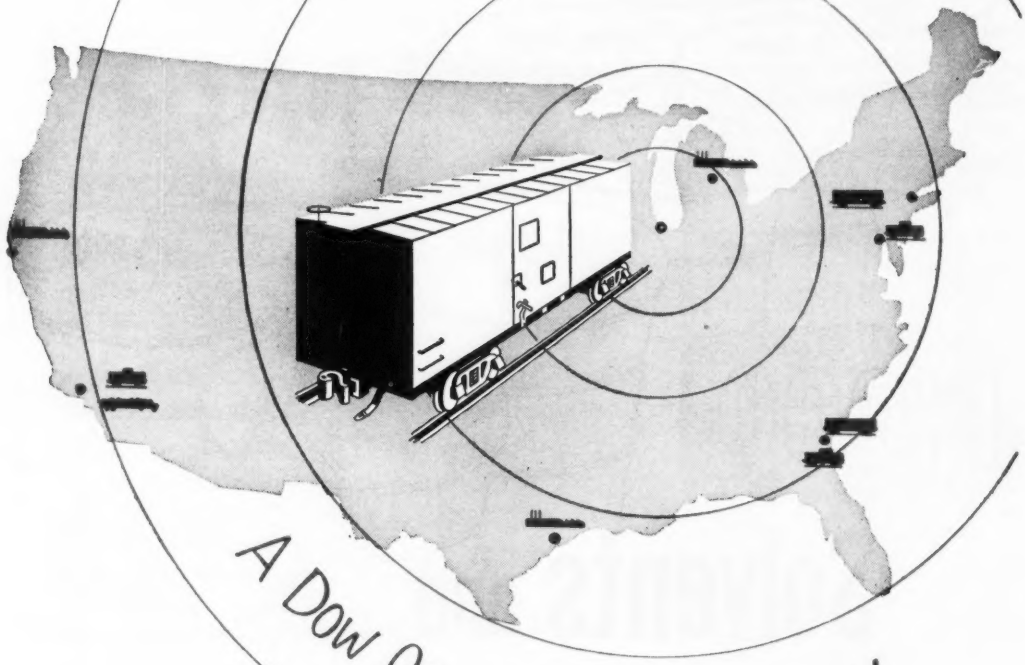
how close are you to Chicago, Illinois?



A Dow Caustic Soda Terminal!

The Chemical Industry Needs Hundreds of Thousands of Tons of Caustic Soda Each Year!

Prompt and efficient caustic soda delivery is of the greatest importance in the chemical industry to keep production steady. For this reason Dow maintains an outstanding network of distribution facilities. In addition to Dow's caustic soda solid, flake and ground flake terminal in Chicago, Illinois—Dow operates caustic soda plants in Midland, Michigan; Freeport, Texas and Pittsburg, California. Dow caustic soda solid, flake and ground flake is also shipped from terminals in Port Newark, New Jersey and Charleston, South Carolina. Caustic soda solution is shipped from bulk tank terminals in Carteret, New Jersey; Charleston, South Carolina and Los Angeles, California. All of these distribution points play an important part in providing the chemical industry with the superior service it requires.

wherever you are... *you're close to*

DOW CAUSTIC SODA

THE DOW CHEMICAL COMPANY • MIDLAND, MICHIGAN

New York • Boston • Philadelphia • Atlanta • Cleveland • Detroit
Chicago • St. Louis • Houston • San Francisco • Los Angeles • Seattle
Dow Chemical of Canada, Limited, Toronto, Canada

DOW
CHEMICALS
INDISPENSABLE TO INDUSTRY AND AGRICULTURE

commission is investigating a complaint by some 350-petition-signing citizens about odors from the factory of the Hi-Yield Fertilizer Co. Furibund citizens call the odors "offensive and injurious to human and plant life."

Most chemical companies would agree with Beatty's neat summation: The problem is complex, extensive experimentation is required, and the company would be willing to spend more money as soon as a practical way is found to deal with air pollution.

KEY CHANGES . .

Joseph B. Cary: To chairman, Food Machinery and Chemical Corp.'s Executive Committee, San Jose, Calif.

Erling Riis: To general manager, Southern Kraft Division, International Paper Co., New York, N.Y.

Donald K. Sorber: To manager, Sales Analysis Dept., Pennsylvania Salt Mfg. Co., Philadelphia, Pa.

Wesley S. Coe: To assistant factory manager, Naugatuck Chemical Division, U.S. Rubber Co., Naugatuck, Conn.

George L. Smead: To manager, polyester resins and fiber glass sales, Plasken Division, Libbey-Owens-Ford Glass Co., Toledo, O.

Arlington R. Meek: To assistant general traffic manager, Solvay Process Division, Allied Chemical & Dye Corp., New York, N.Y.

MEETINGS . . . .

Fourth Symposium on Combustion, international congress, Mass. Institute of Technology, Cambridge, Mass., Sept. 1-5.

Chemical Industries Committee, third session, Geneva, Sept. 9-20.

Natl. Agricultural Chemicals Assn., annual meeting, Essex and Sussex Hotel, Spring Lake, N.J., Sept. 3-5.

Internatl. Leipzig Fair, Fair Palace, Leipzig, Germany, Sept. 7-17.

Amer. Standards Assn., Museum of Science and Industry, Chicago, Sept. 8-10.

Instrument Soc. of Amer., conference and exhibit, Cleveland, Sept. 8-12.

National Chemical Exposition, Coliseum, Chicago, Sept. 9-13.

Natl. Petroleum Assn., annual meeting, Traymore Hotel, Atlantic City, Sept. 10-12.

Tech. Assn. Pulp & Paper Ind., testing conference, Marshall Hall, Syracuse, N.Y., Sept. 10-12.

Packaging Mach. Mfrs. Inst., annual meeting, Homestead Hotel, Hot Springs, Va., Sept. 11-14.

CHEMICAL FINANCING

This bank specializes in chemical financing, particularly in connection with closely held or family owned companies.

We believe in the soundness of the American chemical industry and its prospects for growth and will look sympathetically upon companies or individuals who have financial problems in this field.

Chemical Department

Empire Trust Company

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MEMBER FEDERAL DEPOSIT INSURANCE CORPORATION

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ANHYDROUS SODIUM METASILICATE

DRYMET is the most highly concentrated form of metasilicate available, because it contains no water of crystallization. Unique among alkalies—it combines strength with buffering action which prevents abrupt changes in pH. If you use alkali—investigate DRYMET.

A granular, free-flowing alkali with the following properties:

Formula..... Na_2SiO_3

Molecular Weight...122.06

Na_2O 51%

pH in a 1% Solution..12.75

Quickly and completely soluble in water up to a concentration of 35% 1.0 lb. DRYMET equivalent to 1.6 lbs. sodium metasilicate pentahydrate.

WRITE FOR DRYMET File Folder containing complete technical information.

*Reg. U. S. Pat. Off.

COWLES CHEMICAL COMPANY

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Raymond Multi-Wall Paper Shipping Sacks have a fresh, clean, quality look that appeals to the buyer of quality goods

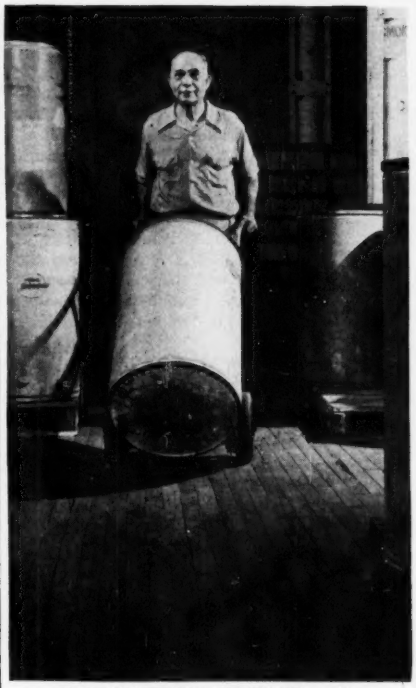
Pack and ship your crushed, powdered, and granulated chemicals in Raymond Paper Shipping Sacks. They are CUSTOM BUILT for your products. They are made in various types, sizes, and strengths. Available printed in multi-colors or plain.

They are SIFT-PROOF! DUST-PROOF! WATER-RESISTANT!

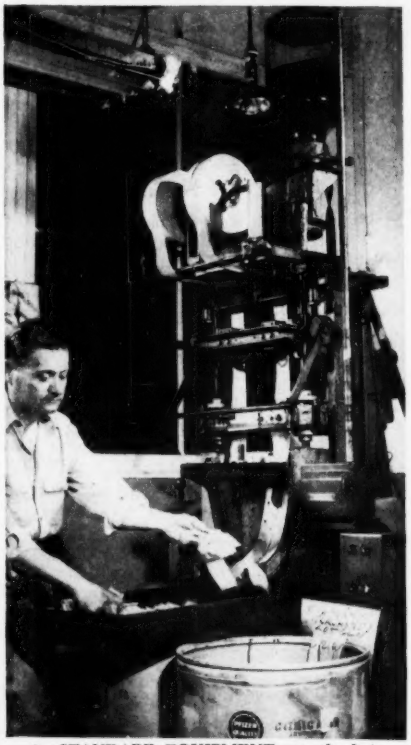
A Raymond representative will be glad to assist you in selecting the perfect Raymond Shipping Sack for your individual packing and shipping needs.

THE RAYMOND BAG COMPANY
Middletown, Ohio

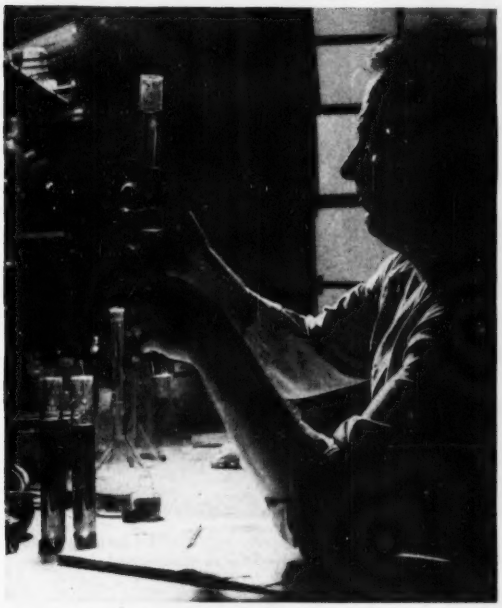
Illustrated front to back
VALVE SEWN SACK
PASTED OPEN MOUTH SACK
PASTED VALVE SACK
SEWN OPEN MOUTH SACK



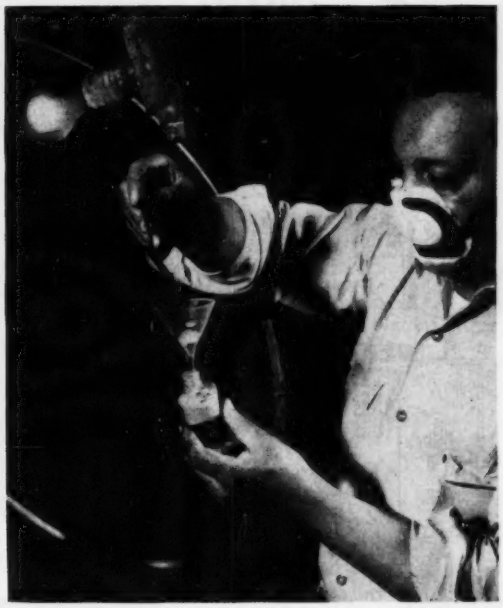
1 RAW MATERIAL STORAGE—and even its procurement—is a key service offered.



4 STANDARD EQUIPMENT puts the hair-rinse powder into heat-sealed envelopes.



2 THE PACKAGER'S LABORATORY checks and maintains quality on starting materials and packaged end products.



3 VERSATILE EQUIPMENT permits on-the-spot blending and simple chemical reactions. This will be a hair rinse.

F. O. B. the Chemical Contract Packager

Private Brands, Inc., a Clifton, N. J., firm which specializes in packaging chemical-process-industry products designed for retail channels, is only a little over six years old. But this month it is in the throes of its fifth major plant expansion program. From all over the U. S., similar stories of booming growth testify that contract packaging is an industry with a future.* The pictures on these pages summarize the services which it has to offer.

The contract packager appeals to two distinct types of customers which may, for simple analysis, be classified as the "big-company group" and the "small entrepreneur." Both types are turning, in increasing numbers but for different reasons, to the contract packager for a solution to their individual problems.

'Branch Plant': Big companies, for instance, are finding that the packagers provide a flexible method of handling off-beat, experimental, or emergency production of small-packaged products. This is especially true when a major company is "feeling its way"

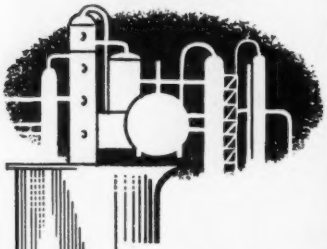
5 MECHANIZED PRODUCTION LINE for assembling the final retail package is the special pride of Private Brands, Inc. Other packages need more handwork.

* A partial list of other major packagers would include companies like Products Packaging (Cleveland), Avon Allied Products (New York), G. Barr & Co. (Chicago), Arner (Buffalo), Strong Cobb (Cleveland), Day Chemical (Newark, N. J.), and Edwal Laboratories (Ringwood, Ill.). Some of them do this work in addition to producing their own trade-marked line of products.

PETROCHEMISTRY

A Growing Giant

IN OKLAHOMA

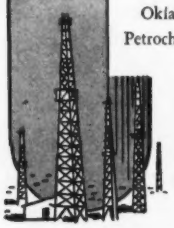


NEW ventures in petrochemicals — products of America's newest and greatest industry — demand increasingly greater facilities for expansion.

Oklahoma's high position in petroleum production and processing, plus its proven reserves, guarantees a stable supply of the basic raw materials needed by Petrochemistry.

Oklahoma's strategic location assures economical transportation of finished products to market.

Oklahoma! Pioneer in Petrochemistry!



A special, confidential study of Oklahoma's answer to your basic petrochemical requirements will be made upon your request and without obligation.

OKLAHOMA
PLANNING AND RESOURCES BOARD
Write - Cecil Longston, Director
State Capitol Bldg.
Oklahoma City, Okla.

Make More Money
IN OKLAHOMA

6 **FINAL PRODUCT STORAGE is also a packager's responsibility. In many cases, it is also his problem to keep end-product inventories coordinated with sales.**

7 **THE SHIPMENT TO A CUSTOMER ends the contract packager's handling of his client's product. These movements vary according to the latter's distribution pattern. Some go to wholesalers or central warehouses, others direct to retailers.**

into retail trade channels. The packagers are thus riding the crest of the current interest among chemical producers in "up-grading" their products to the point where they can be sold for the profitable consumer dollar.

The packagers' plants are ideally suited for this type of work because they are purposely versatile—allowing the client to run several lots of different-size packages, for instance, before settling on one (picked by consumer acceptance) and making the heavy investment for his own production line.

Other large companies are using the contract packager as an intermittent "branch plant," depending on him to turn out the quantities of finally-packed products needed to meet seasonal peak demands. This permits the manufacturer to limit his equipment investment and to level out his employment pattern. Still other companies are using the packager when planning promotion programs involving small samples. Private Brands, for instance, considers itself an expert on such "miniatures" and is willing to prepare the complete mailing piece.

Often a large, bulk-commodity pro-

NOW AVAILABLE...

from CARBIDE AND CARBON'S expanded production facilities

Ethanolamines are available now in greatly increased quantities—a result of added facilities for production of Ethylene Oxide.

Mono-, di-, and triethanolamines have been produced by CARBIDE and CARBON since the 1930's. CARBIDE's long experience in production of these basic materials assures you of high, uniform quality.

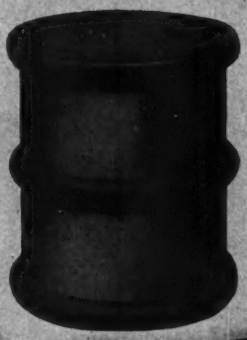
Use ethanolamines for acid gas absorption, for solubilizing 2,4-D. and for making synthetic detergents, soluble metal-cutting oils, corrosion inhibitors, and other amine derivatives.

Drum stocks of ethanolamines can be delivered promptly from warehouses in principal industrial areas. Compartment and full tank car lots can be shipped promptly to meet your needs.

For complete information, phone or write our nearest office.

CARBIDE AND CARBON CHEMICALS COMPANY
A Division of
Union Carbide and Carbon Corporation
30 East 42nd Street UCC New York 17, N. Y.

ALL RUBBER DRUM



SAFE AND EASY TO HANDLE!

NO METAL

NO BREAKAGE

for

- MURIATIC ACID
- HYDROFLUORIC ACID
- FERRIC CHLORIDE
- CORROSIVE LIQUIDS

★

ICC-43A SPEC.
Tare Weight—34 lbs.
13 gallon capacity

★

Made with
Natural, Neoprene,
Butyl or other Synthetic
Rubber Linings

★

Threaded or Stopper type closures

GENERAL

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MECHANICAL GOODS DIVISION
WABASH, INDIANA

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NEWARK, N. J. • LOS ANGELES, CAL.

ducer with a retail sideline will turn to the contract packager in order to take advantage of the latter's inherently lower labor costs. Plant-wide or industry-wide wage rates can be prohibitively expensive when applied to the handwork that goes into the average retail package. Products Packaging, Inc. (Cleveland), for example, packages over 100 different items for a major Midwestern oil refiner, ranging all the way from Christmas candles to weed killers.

'Production Department': The small entrepreneur, on the other hand, has his own reasons for using the contract packager's services—summarized in the words of one leading packager: "The small guy, starting out on his own, has a selling job on his hands—he shouldn't have to worry about the production end."

To the lone Horatio Alger with a chemical combination that he thinks should find a ready market, the contract packager can indeed offer a variety of helping hands. Since most such products involve a minimum of chemical processing and a maximum of packaging problems, the small-company owner can virtually ignore the task of making the product and concentrate instead on the job of making the sales.

The packager will buy and store the raw materials, blend the components or put them through simple chemical reactions, package and store the end product, and finally arrange the shipments to the customers. For all this, the entrepreneur pays on a per-unit basis for those quantities actually packaged—which should approximate his direct sales. Financially, he has avoided almost all capital investments, often including even the costs of raw-material stocks—if he sticks to standard bulk commodities.

Not to be ignored, too, is the psychological benefit of knowing that if the product catches on and the sales climb steeply, he will be able to meet the demand before it is dissipated. Conversely, if the idea falls flat on its face, he can bow out of the market with a minimum loss.

Confident that the current trend toward retail-level chemical selling is just getting under way, the contract packaging industry—with support from both the big and the little companies—is self-assuredly planning and building for fat years ahead.

•

More Odorless: Tank-car shipments of light and heavy odorless solvents for the paint industry are now being made from Sinclair Refining's Houston, Texas, plant. Sinclair has just completed major additions to its refinery in that city which will enable it to commence large-scale commercial production of the solvents.

•

Conductive Carbon: High conductivity and high reinforcement properties are the combined claims for a new oil furnace carbon black being produced by Godfrey L. Cabot, Inc. (Boston, Mass.). Named Vulcan C ("C" for conductivity), the material is said to have superior electrical properties compared with others now used in the rubber industry.

•

Chemical Standards: Purchasing agents, sales managers, and company engineers will all be involved in the American Standards Association's next attempt to promulgate industry-wide standards for the chemical process industries. Monsanto's W. T. Nichols has been chosen as moderator of a chemical panel discussion to be held in Chicago on Sept. 10. This will be the final item on the agenda of ASA's Third National Standardization Conference.

•

Credit Where Due: Mutual Security Agency, at the behest of Congress, is stepping up its effort to have manufacturers display the MSA "emblem" on all products being shipped overseas under its program. The emblem, a stars-and-stripes shield with the legend "Strength for the Free World—From the U.S.A.," should be attached to inner packages as well as the outside shipping crate, and capital goods should carry it as a metal tag.

Biggest and Best

The nation's privately owned merchant tanker fleet is now the world's largest, fastest, and finest—according to statistics compiled by the National Federation of American Shipping.

As of mid-1952, the oceangoing fleet is made up of 451 ships representing 6.7 million deadweight tons. That makes it the largest in U. S. history and the world's biggest under any one national flag.

Most of these ships are being used in coastwise and intercoastal trade, but an increasing number are entering into international channels. In part, this is a reflection of the change is the U. S.'s petroleum position. It is now a net importer rather than a net exporter.

But the American fleet's stature is due for some alteration in the near future. Although it now represents 24% of the world tonnage, only 6.6% of the 11.5 million deadweight tanker tonnage now being built here and abroad are for registry under the American flag.

MONOETHANOLAMINE

For use as . . . a gas scrubbing agent for recovery of hydrogen sulfide and carbon dioxide . . . a chemical intermediate in the manufacture of various surface active agents, rubber chemicals, and other materials . . . an agent in the manufacture of antibiotics.

DIETHANOLAMINE

For use as . . . an intermediate in the manufacture of surface active agents used in textile specialties, herbicides, petroleum demulsifiers, etc. . . . a gas scrubber in refinery operations . . . a rubber chemicals intermediate.

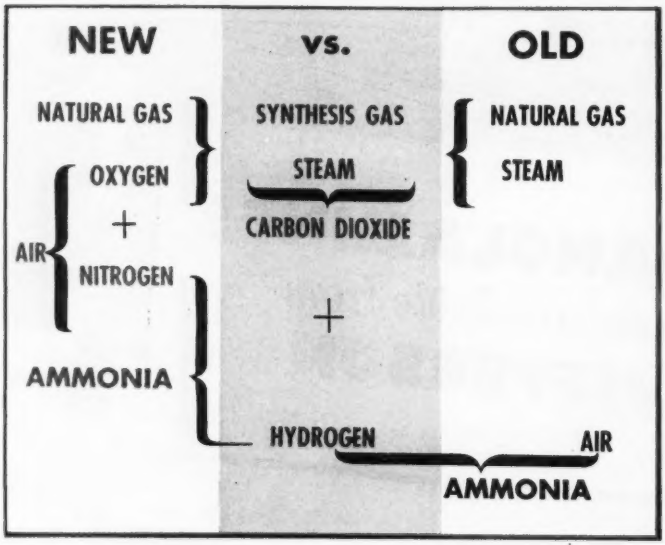
TRIETHANOLAMINE

For use as . . . an intermediate in manufacture of surface active agents used in textile specialties, waxes and polishes, herbicides, petroleum demulsifiers, toilet goods, cement additives, cutting oils, etc. . . . a rubber chemicals intermediate.

Jefferson
CHEMICAL COMPANY, INC.
260 MADISON AVENUE, NEW YORK 16, N. Y.

Essential Chemicals From Hydrocarbon Sources:

Ethylene Oxide
Ethylene Glycol
Ethylene Dichloride
Diethylene Glycol
Monoethanolamine
Diethanolamine
Triethanolamine



Oxygen Upstages Steam

A new way for getting hydrogen from natural gas is the latest wrinkle in ammonia plants.

Three companies are ready to back it with $33 million in plants to make almost 190,000 tons a year.

The key is a partial oxidation of the natural gas with oxygen instead of steam.

There's a popular concept of the chemical process industry that runs something like this: Take some coal and air, add a little water. Then brew the concoction for a few hours in a series of kettles. By varying the proportion of ingredients and the length of the brew, you end up with any one of several products: nylon stockings, plastic ash trays, rubber tires.

Ten or fifteen years ago, that oversimplified recipe wouldn't have been very wide of the mark in describing the commercial production of ammonia; for, prior to the war, most of the country's ammonia was based on coke, steam and air. During the war-born boom in ammonia, however, and fat expansions since, production men turned to natural gas; today that's by far the biggest source of hydrogen for ammonia.

Now, a new process for winning the hydrogen from natural gas is quietly catching on in the synthesis of ammonia. It's slated for use in new plants of two companies, Spencer Chemical and Deere & Co., is an odds-on favorite for W. R. Grace's proposed venture into the field. And a small but respected group of experts think that those three will be merely the first of many.

Developed by Hydrocarbon Research under the direction of Dobie Keith*, the process is jointly owned by that firm and The Texas Co. Originally it was intended for synthesis gas in Fischer-Tropsch units and has been used for that purpose by Carthage Hydrocol (at Brownsville, Tex.) for some time. Only recently has it been adapted for ammonia.

Multiple Choice: There are almost as many ways of getting ammonia from natural gas as there are producers. All the present commercial processes, however, are based on the same reactions. Natural gas, chiefly methane, reacts with steam at elevated temperatures in the presence of a catalyst to form synthesis gas (carbon monoxide and hydrogen). Further treatment of the monoxide with steam produces more hydrogen. Nitrogen (from air) then combines with the hydrogen to form ammonia.

* Who designed the gaseous diffusion plant at Oak Ridge, as well as the two 1,000 tons a day oxygen plants for Carthage Hydrocol.

Like the older one, the new version depends on the intermediate formation of synthesis gas and then a reaction with steam to get more hydrogen. Big difference is in the use of tonnage oxygen—rather than steam—for the initial oxidation of natural gas. The required oxygen plant also produces high purity nitrogen for the final conversion to ammonia.

On paper, the new process looks like a simple way to get synthesis gas. The trick, as pointed out in the basic patent*, is to do it under pressure. For several undesirable side reactions can take place (including the formation of carbon) and they are all favored by higher pressure. But Hydrocarbon Research found that production of carbon could be minimized and the desired reaction could be carried out efficiently by prolonging the contact time to between 1 and 20 seconds (preferably 3-10).

Details on the process and economies involved are carefully guarded by the trade. But Spencer figures that it can cut its operating costs by 6% and capital costs appear to be in line.

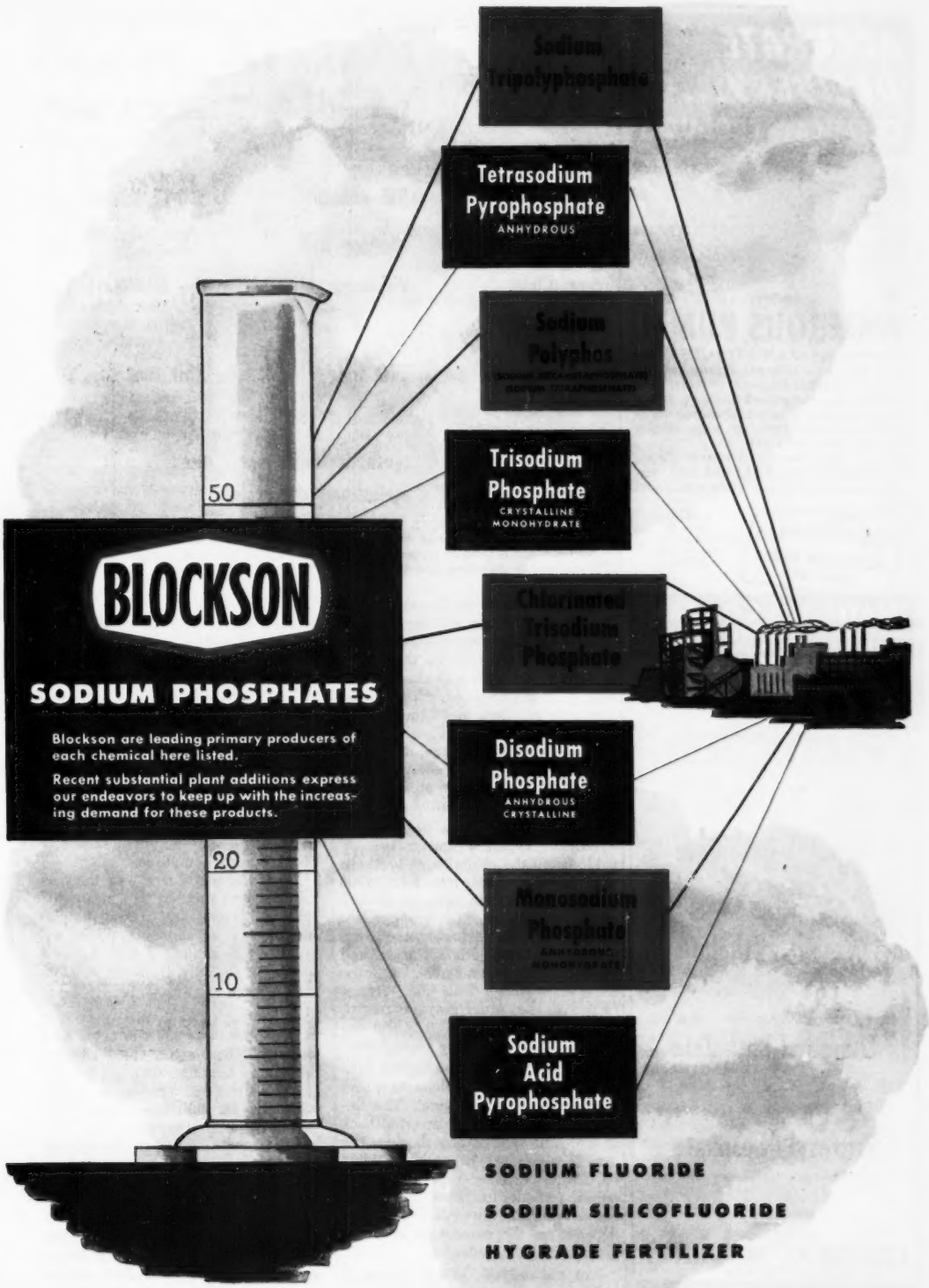
Spencer will use the process at its now a-building $15 million plant in Vicksburg, Miss. To be built by Foster Wheeler, Spencer's plant will use a $1 million oxygen-nitrogen generator made by Air Products Co. (Emmaus, Pa.) The generator will separate 180 tons of oxygen (98%), 310 tons of nitrogen (almost 100%). Spencer will use a low pressure process for converting the nitrogen and hydrogen into 200 tons of ammonia daily. About 50% of the product will go into agricultural chemicals, the rest will be used in synthetic fibers.

Urea, Too: For its debut into the chemical field, Deere, the big farm machinery manufacturer, has also chosen the process. It has obtained licensing rights, expects to get a plant site near Pryor, Okla. Deere's plant will also be built by Foster Wheeler and will produce about 180 tons of ammonia per day. In addition, Foster Wheeler will construct a plant for converting the ammonia into a maximum of 275 tons of urea and 70 tons of urea-ammonia solutions.

The estimated investment by Deere is $18-21 million for the whole project. That breaks down into $7-8 million for the ammonia plant, $5-6 million for the urea plant, $3.5-4 million for labs, offices, warehouse, etc. and $2.5--3.0 million for pre-production expense and working capital.

For the actual conversion of the nitrogen and hydrogen to ammonia,

* U.S.P. 2,491,518.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PRODUCTION . . . . . .

Scorecard on the New Process

Deere & Co.	Spencer Chemical	and W. R. Grace*
will spend approximately		
$7-8 million	$15 million	$10-12 million
on plants in		
Pryor, Okla.	Vicksburg, Miss.	the Mid-West
with daily capacities of		
180 tons	200 tons	250 tons
of ammonia which will be used to make		
urea	synthetic fibers and agricultural chemicals	urea

* Although W. R. Grace reports it has made no official commitments, it has received a certificate of necessity for a $15 million nitrogen facility, including a 250 ton-a-day ammonia plant in the Mid-West.

Deere will license the Casale process from Foster Wheeler and the Pechiney process for urea from the same company. A recycle process, the Casale is carried out at 6-800 atmospheres, 500° F, in the presence of a promoted iron catalyst. Instead of the recirculating compressor, the Casale process uses an ejector which gets its driving force from the main discharge stream leaving the charging compressor. Conversion per pass is reportedly 15-18%.

In the Pechiney urea process, also a recycle, ammonia and carbon dioxide (from the oxidation of synthesis gas) are converted into ammonium carbamate, then to urea. A cooled, neutral circulating oil is brought into contact with the initial gas mixture of ammonia and carbon dioxide, and produces ammonium carbamate in the form of a slurry. This slurry is returned to the initial pressure reactor where the oil absorbs the heat released in the carbamate conversion.

From the pressure reactor, the mixture of oil, urea and carbamate is sent to a lower pressure vessel. The unchanged carbamate is converted back to ammonia and carbon dioxide; the urea is separated from the residual oil. Foster Wheeler reports that the recycle provides for almost a complete conversion but the exact efficiency depends on the percentage of inerts in the carbon dioxide.

Not Committed: W. R. Grace is quick to point out that it is not formally committed to any particular line of action as yet. It does say that it will spend over $20 million on nitrogen facilities somewhere in the Mid-West. And it has received a $15 million certificate of necessity for a project that includes a 250 ton a day ammonia plant.

It's a safe bet that Grace is planing a venture very similar to Deere's and that the processes employed will be the same: partial oxidation with oxygen for the synthesis gas, Casale ammonia and Pechiney urea processes. Likely plant sites: Southern Illinois or Southwestern Tennessee.

Assuming that Grace uses the partial oxidation process, that means the three companies are backing it with investments in ammonia plants exceeding $33 million. It adds up to a total new capacity of almost 190,000 tons a year.

EQUIPMENT . . .

Industrial Barometer: The Defense Production Administration has just disclosed additional expansion goals which are an additional indication of chemical industry growth:

- The expansion goal for the regenerative air preheaters has been boosted 168 units; from an annual capacity of 216 units on Jan. 1, 1951 to 384 units by Jan. 1, 1954.
- The production goal for the tubular heat exchangers has been set at an annual capacity of 58.5 million square feet of heat exchanger surface to be completed by Jan. 1, 1954. This

PRODUCTION. . . . .

represents an expansion of 20 million square feet over Jan. 1, 1951.

• An annual production capacity of tanks to consume 1.5 million tons of steel is to be completed by July 1, 1953; an increase of 250,000 tons over Jan. 1, 1951.

• A $35 million expansion in capital investment, over the July 1, 1950 capacity, has been set for pumping machinery. This goal, which includes pumps, compressors, and industrial fans and blowers, is to be completed by July 1, 1954.

Certificates of necessity have been issued for only a part of these projected expansions.

•

Aluminum Bus Bars: The Trumbull Electric Department of the General Electric Co. (Plainville, Conn.) is now offering a new line of aluminum bus bars which weigh 30% to 70% less than corresponding copper bars. Trumbull's new aluminum LVD-5 line of busways has been listed by Underwriters' Laboratories for the following ratings: from 600 to 4000 amperes at 600 volts or less for 2-pole, 3-pole, 3-phase 4-wire, and 4-pole systems. The FVK line with aluminum bus bars is available in ratings of 225, 400, 600 and 800 amperes at 600 volts or less.

•

Portable Pump: A new, gasoline-powered pump, especially engineered for portable fire-fighting work, is now available from McCulloch Motor Corp. (Los Angeles). It is self-priming, weighs 57 lbs, has a capacity of 15,000 gal per hour.

•

Photo Cameras: Two new photomicrography cameras have been developed by the Bausch & Lomb Optical Co. (Rochester). One is the application of the Polaroid Land Camera to B. & L. equipment where finished prints can be made in one minute.

The other is an Eyepiece Camera which can be attached directly to the microscope. This unit contains a ground glass viewing screen for field selection, focusing and snapping the picture without interruption.

•

Info on Lead: In answer to a growing need for lead construction in the chemical process industry, said Peter Krebb last week, the National Lead Burning Association has inaugurated a program to prepare and distribute technical data on lead as a material of construction. Krebb, counsel for the association, says engineering specifications and standards will be released, adds that the new program will complement the work of the Lead Industry Association.

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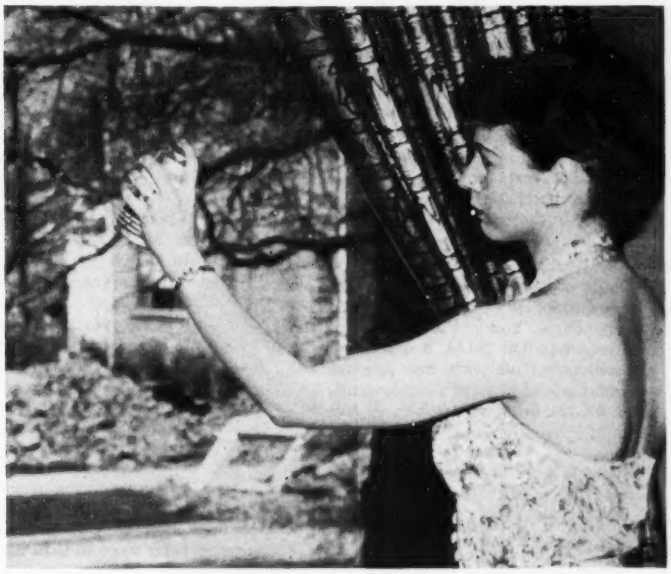

SHADE SPRAY: Transparent blind foils fade-out.

Future for U.V. Filters

Sun-tan lotions aren't the whole of the ultra violet-screening chemicals trade. One of the newer segments is represented by Fade-Proof Corp. of America's (Chicago) Fade-X, a window-coating compound designed to block out the rays that fade merchandise and fabrics.

Fade-X is an aerosol-dispensed, organic sun-screener. Introduced only a few months ago for use on store show windows (to replace the familiar protective yellow acetate sheeting). Housewives have since found it helpful in stopping the fading of drapes and carpets.

In developing the aerosol, Fade-Proof had to find a sun-screener that would be compatible with the plastic resin base, as well as with the Freon propellant. Just which UV energy-absorbing molecule Fade-Proof is using hasn't been revealed, but it is said to absorb about 97% of the sun's UV radiations.

Pushbutton Put-On: Application of Fade-X is relatively simple. The window to be treated is cleaned, and preferably rubbed with alcohol. Then the sun screener is sprayed on (for best results at temperatures in the 70-80F range). The resulting colorless, invisible film is reported to offer three to four months of protection, and to reduce soiling of the window, too.

So far, competition hasn't appeared, at least of the aerosol variety. Customized work, guaranteed for a year, can be had at a cost of about 70¢ per sq. ft.—a rather high tariff, since the 12-oz can of Fade-X covers about 175 sq. ft., costs only $2.49.

Fade-Proof Corp. is the baby of Harry Wohl and Ted Garfield. Wohl, president, started in business for himself back in 1936 with a small outfit that fabricated stainless steel malted milk cups and coffee makers. Garfield—secretary, general manager, and research director—left Standard Brands to join Wohl in 1946, stayed on in 1950, when Wohl sold out to Cory (keeping his plant).

Wohl and Garfield have nursed along more than one Fade-Proof Corp. product. Another of their specialties is Glare-X, an aerosol-applied product designed to inexpensively duplicate the blue-green tint of glass like Pittsburgh Plate Glass Co.'s Solex.

Applied to auto windows, the Glare-X light-fast film is supposed to last a year, apparently impervious to soap and water. Fade-Proof claims it doesn't produce distortion, won't peel or crack. Distribution of the 6-oz, $2.29 can is through auto accessory stores.

Both aerosols are packed by Aeropak, Inc., using valves originally developed by Dyna-Spray for the artificial snows.

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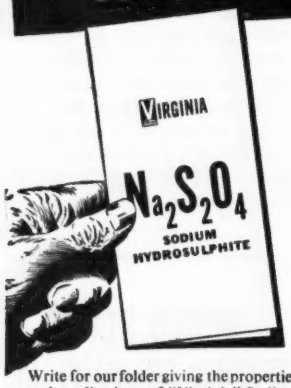

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SPECIALTIES

Durable Bottles: Ivan Sorvall, Inc. (New York) is specifying polyethylene bottles as optional equipment for two types of its Servall angle centrifuges. The bottles, made by Plax Inc. (Hartford, Conn.) are said to withstand speeds up to 3,500 rpm.

•

Building Acquired: King Chemical Co., a new corporation in St. Louis, Mo., has purchased a new industrial building in that city for $43,000.

•

Super Soaker: A new oil for crepe soaking of rayon skeins or cakes has been developed by Dexter Chemical Corp. (New York). Called Dextrol Rayon Crepe Oil #114, it is a blend of sulfonated oil with free coconut oil, and is said to form a stable emulsion for use in either machine or tub soaking.

•

Insect Nixers: The American Nexa Corp. (New York) is introducing to this country a new kind of lindane vaporizer. Called NEXA fumigating strips, they are lindane impregnated papers, which can be burned in an an ash-tray to control insects. Packed in cellophane, packets of the strips retail at 25¢, are said to be USDA-registered.

•

Bio Lab: A new agricultural and biological research institution has been established at Creve Coeur, Mo., by the Organic Chemicals division of Monsanto Chemical Co.

•

Better Service: Sylvania Division of the American Viscose Corp. has expanded its customer development and packaging research work in its Marcus Hook, Pa. facilities.

•

Luxuriant Growth: Wildroot Co. Inc., (Buffalo, N.Y.) maker of hair preparations, is building a $140,000, 175,000 sq. ft. addition to its warehouse. Rapid growth of the firm has necessitated the expansion, which should be completed by September of this year.

•

Mosquito Battle: California's battle against the Culex tarsalis mosquito (*CW, Aug. 9*) continues unabated. The state has allotted $250,000 to clear out the insects, which have caused near-epidemic outbreaks of encephalitis in California's Central Valley.

Help has also come from the U.S. Public Health Dept., which has sent in physicians, veterinarians, entomologists, and mosquito abatement engineers. Already at least 17 deaths have been attributed to the insect-borne disease; 166 cases reported. DDT, lindane, toxaphane, and Rhothane are the most used chemicals in this drive to control mosquitoes.

•

De-ruster: HomeCraft Rust Remover is a new de-corrosion compound marketed by the Bedford Co., (New York). Home packages, 6-oz, at $1.00 are available, as well as gallon and half gallon containers (at $9.95 and $6.95) for industrial use.

•

Fast Frost: Chemical Development Corp. (Danvers, Mass.) has developed a treatment to match the finish of sand-blasted acrylic plastics. Called Acrylic Frosting Lacquer 158A, it is applied by brush or spray, produces a smooth, sand-blasted effect in a few minutes.

•

Alcoholics and Carbon Tet: A recent article in the American Medical Association's Archives of Industrial Hygiene and Occupational Medicine brings out a new angle on the toxicity of carbon tetrachloride: Alcoholics are extremely sensitive to carbon tetrachloride fumes, far more so than non-habitual drinkers.

•

New Repellents: Boasting more than a limited appeal to sportsmen, several new insect repellents are making their debuts. Shoo is one. It's a stick-type product containing 448 (the government-developed repellent) in an alcohol and sodium stearate base. Said to offer from four to six hours of protection, its maker, Merlee, Inc., (Minneapolis) claims it to be the only stick repellent made with 448. Five ounces of Shoo cost $1.

Andy Lotshaw Co. (Chicago) is producing these repellents: Pellent, a tubed ointment made with 2-phenyl cyclohexanol and 2-cyclohexyl cyclochxanol. One ounce sells for 66¢; two ounces bring $1. Pellent Stick contains the same ingredients, is sold in metal-push-up tubes; 1¼ ounces for 75¢.

•

Tubed Lube: Silicote Corp. (Oshkosh, Wis.) is selling two new silicone-based lubricants. Packed in aluminum tubes, selling for 49¢ each, are Silicote Gear Lube and Silicote Spinning Reel lubricant.

•

More Elbow Room: Morris Plains (N.J.) is the site for a proposed new Warner-Hudnut, Inc. pharmaceutical manufacturing plant. Ground, on a 48-acre tract in the New Jersey community, was broken last week; completion is scheduled for Oct., 1953. The project will provide the company with an additional 130,000 square feet of space for expanded output of ethical and proprietary drugs.

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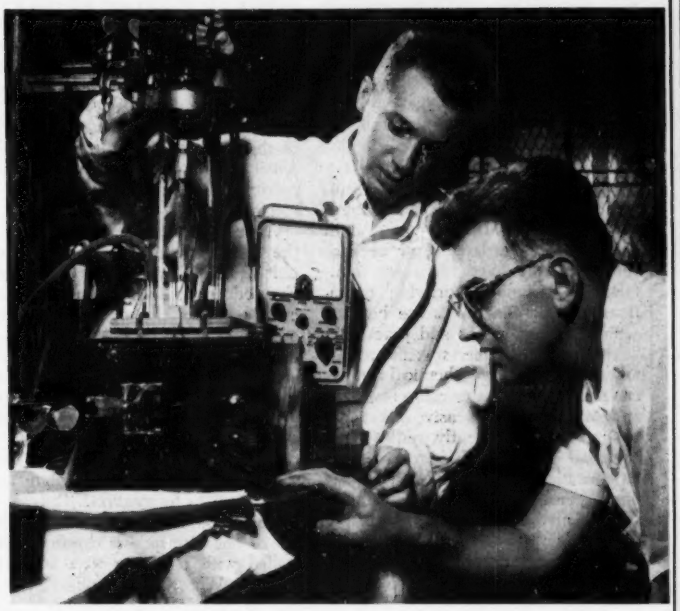

DIAMOND (left) and SOFFER: Cutting a new path with electrochemistry.

New Potential for Hormones

Hormones by electrochemical synthesis is the goal of research now under way at Pratt Institute, Brooklyn, N.Y.

High yields, simplified processes, cost reductions are the promise of electrochemical techniques.

But commercialization hinges on the outcome of substantial research and development still ahead.

New manufacturing methods are once again bringing hormones to the fore. This time, electrolytic oxidation and reduction techniques promise to increase yields, simplify operations and reduce costs of physiologically-active materials derived from cholesterol, sitosterols and other steroid starting materials.

George B. Diamond, professor of chemical engineering at Pratt Institute, and Milton D. Soffer, professor of organic chemistry at Smith College, are the brains behind this research.

The work is being carried on at Pratt Institute (Brooklyn, N.Y.) which supported exploratory studies. Now, the project is receiving an added boost from a joint grant by Schering Corp. (Bloomfield, N.J.) and Research Corp. (New York).

The potential value of the work is underscored by progress which has already been made: 2-methoxy naphthalene, for example, has been reduced to its enol ether, subsequently hydrolyzed to 2-tetralone. Homologs have also been converted to desired end-products by electrolytic reduction and simple chemical manipulation. Such reductions are not unknown to the chemical literature; maximum yields, however, are usually no higher than about 50%.

In the electrochemical reductions, yields are claimed to be essentially quantitative. And Diamond estimates that a commercial plant utilizing his process could realize yields greater than 95%.

Of course the several above-mentioned compounds are neither hormones nor steroids. But they have been used as research intermediates in the synthesis of hormones and they

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do personify some fundamental problems of structural conversion common to steroids.

If electrochemical techniques cope with these relatively simple analogs, there is good reason to believe they can handle steroids as well. Extension of the experimental work to steroid starting materials is the next logical step, slated to begin shortly.

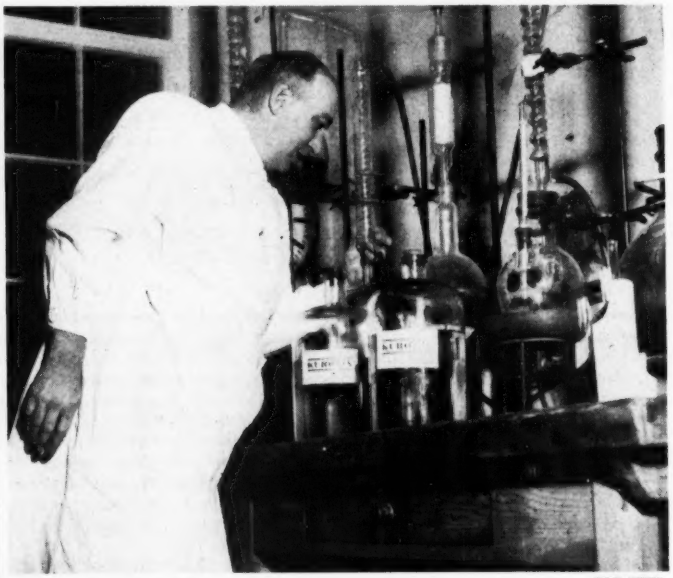
It has been found that electrochemical methods, where they can be used, are more selective than their straight chemical counterparts. And because complicating side-reactions are minimized, subsequent purifying operations are simpler, yields are better.

Besides high yields and practically no by-products, other specific advantages are: The electrochemical process can at times by-pass pressure reactions and/or the use of expensive or hazardous reagents frequently required in chemical syntheses. Electrode potentials as high as 2.7 volts can be applied, permitting the use of cheaper starting materials which are normally quite difficult to oxidize or reduce.

But it's not all peaches and cream. Necessary equipment is not commercially available, must be specially designed for the application. And it's sometimes necessary to recover expensive electrolytes and solvents if the economic edge is to be realized. Also, more floor space will be required for a commercial setup than for straight chemical units. Lack of know-how currently is another not-inconsequential stumbling block. Of course, some of these drawbacks will disappear as development procedes; others of necessity, will remain characteristic of electrochemical processes.

Alter to Suit: The cell consists of the conventional two-compartment unit separated by a porous diaphragm. For reductions, it is fitted with mercury, or other high-overvoltage cathodes, and carbon anodes. When oxidation is required, low-hydrogen overvoltage cathodes, (e.g. platinized platinum) are used with high-oxygen overvoltage anodes—lead, for example.

The cell is charged with a single or two-phase aqueous-organic solvent system containing an electrolyte and the steroid to be modified. Current is passed through the unit as the potential of one electrode is carefully controlled with reference to a standard half-cell. When the electrolysis, which may be continuous, is complete, the desired product is extracted or filtered



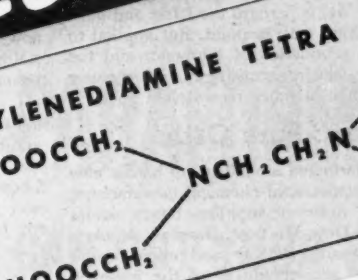
WIDE WORLD

Glycerine in Jeopardy?

A CHEAP, SYNTHETIC substitute for glycerine is the claim of 52-year old German chemist Herbert Kurth. Kurth, shown here in his laboratory at Oberursel (near Frankfurt), calls his brainchild Kurozin, says all ingredients needed for its manufacture are available within the country. Composition of the new material hasn't been revealed. But the German chemist has gone on record with the hope that large-scale production of Kurozin will free his country from the need for future glycerine imports.

SEQUESTRENE

ETHYLENEDIAMINE TETRA ACETIC ACID



APPLICATIONS

SOAPS, DETERGENTS, SANITIZERS . . . foam stabilizer and detergency builder for soaps and surfactants . . . synergist for quaternary ammonium and phenolic germicides . . . formulation of caustic soda bottle washing compounds, floor cleaners, milk stone solvents, rust removers, heavy duty metal cleaners and polishes, paint stripper, laundry alkali . . . stabilizer for polyphosphates, metasilicates, peroxides . . . formulation of detergent-sanitizers, liquid detergents, potash soaps and shampoos, hard water toilet soaps, optical bleaches . . . rancidity and oxidation retardant for soaps, sulfonated oils, alkyl aryl sulfonates.

METAL FINISHING . . . formulation of polishing, buffing and cleaning compounds . . . anodizing of aluminum, magnesium . . . immersion and electroplating of copper, zinc, cadmium, brass, nickel . . . metal and metal oxide stripping.

COSMETICS . . . as a clarifier, foam builder and water softener in soap shampoos . . . stabilizer for sulfite cold wave . . . formulation of hair rinse, hair coloring solutions, bubble bath, cuticle softener . . . color stabilizer for sun screens, perfumes, essential oils.

RUBBER, POLYMERS . . . stabilizer for natural and synthetic latex to retard oxidation, rancidity, film tackiness . . . iron scavenger in polyethyleneamine activated butadiene-styrene copolymerization; iron complex is itself a polymerization catalyst . . . color stabilizer for resin emulsion paints.

AGRICULTURE . . . formulation of 2, 4-D amine sprays . . . metal complexes for nutrient solution use; treatment of mineral deficiencies in agricultural crops.

FOODS, BEVERAGES . . . clarifier for wines, vinegar . . . stabilizer for dairy products, frozen fruits and vegetables, salad dressing and mayonnaise, milk and egg powders, flavors and essential oils against metal catalyzed oxidation . . . processing of soft cheeses, soft curd milk, blood sausage . . . wash for seafood products to prevent discoloration and struvite formation; for fruits and vegetables to remove metal salt sprays.

MINERAL PROCESSING . . . fractional precipitation and separation of rare earths . . . as a depressor in flotation of copper, manganese and other ores . . . as an adjuvant in liquid-liquid extractions and ion exchange separations.

MEDICINE, PHARMACEUTICALS . . . preservation of whole blood, platelets; fractionation of blood proteins . . . treatment of renal lithiasis, hypertension, skin infections; detoxifying agent in lead and mercury poisoning . . . stabilization of pharmaceuticals subject to metal catalyzed oxidation (ascorbic acid) or hydrolysis (peptides) . . . potentiation of epinephrine . . . elimination of prescription incompatabilities . . . neutralizing agent for pharmaceutical bases.

TEXTILE PROCESSING . . . prevents streaking, spotting, dulling, crocking, poor color yield and shade change in dyeing . . . kier boiling and continuous scouring . . . in printing pastes to prevent livering . . . stabilizing of peroxide bleaches . . . stripping chromed and coppered dyeings . . . in viscose spinning baths . . . rubber latex treatment.

MISCELLANEOUS . . . stabilization of hydrazine, diazonium chlorides, formaldehyde, mercaptans, etc. . . . putrefraction inhibitor in starches, pectins, proteins . . . as water softener in photographic developing baths . . . radioactivity decontamination . . . water treatment . . . analytical, clinical, histological reagent . . . leather processing . . . slow setting cement . . . purification of inorganic and organic chemicals.

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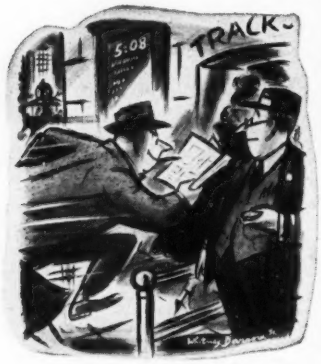

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Chemical Week

One of a series of ads prepared by
THE ASSOCIATED BUSINESS PUBLICATIONS

off, depending on its physical state.

Electrochemistry is hardly new to industry, has time and again been put to excellent advantage; Minnesota Mining and Manufacturing Co.'s electro-fluorination process (CW, Oct. 27, '51) is perhaps the latest and most striking case in point. But applied to the production of hormones and the like, electrochemistry is cutting a new path in a much-reasearched field.

Now: Pure Ortho

Chlorinated aromatics are hardly new to commercial chemical manufacture; the roster of suppliers boasts names like Dow, Du Pont, Harshaw, Hooker, Monsanto, Solvay and other prominent representatives of the industry. But for pure chlorinated aromatics, especially polychlorinated compounds, you would probably call on a custom-chemicals producer. With the introduction of a pilot-plant technique for producing high-purity chlorinated aromatics, Solvay Process Div. (Allied Chemical and Dye Corp.) is realigning this somewhat paradoxical situation.

First of Solvay's new pilot products is o-dichlorobenzene.

Most commercial grades of o-dichlorobenzene contain substantial amounts of impurities in the form of other dichlorobenzenes, mainly the para isomer. These impurities, although harmless in many applications of the "ortho," are difficult to remove, interfere with organic syntheses by introducing undesirable by-products. Solvay says its new grade of o-dichlorobenzene contains less than ½% total impurities.

Solvay's pure product doubtless is a dividend of a new (and confidential) isomer-separating technique recently initiated at its Syracuse (N.Y.) plant. But the infra-red spectrophotometer gets a well-deserved assist in the development. The instrument is used in process quality control, spots contaminating isomers and trichlorobenzenes with a high degree of accuracy.

Outlets for the pure grade of "ortho" are, for the most part, undeveloped. Because of the material's controlled dielectric constant, it appears well-suited for use as the solvent in a relatively new U.S. Department of Agriculture procedure for analyzing vegetable oils, gums, natural resins and similar products.

And pure "ortho's" freedom from higher-boiling impurities suggests its use as a solvent in stains, dyes, varnishes and polishes where evaporation time is an important factor. Its lack of residual odor also should appeal to paint manufacturers.

Solvay further believes its new pure product has something to offer in the role of an intermediate in dye (e.g. indanthrene golden orange GN) manufacture where uniformity of product is of prime importance. Cost of the new grade of o-dichlorobenzene is now pegged to its pilot-plant plant status, could be adjusted to large-volume demand.

•

Plastic Entry: A new, heat-resistant addition to its Styron line of plastics is newly available from Dow Chemical Co. Dubbed Styron 700, the new plastic is capable of withstanding temperatures up to 220 F, more than 20 degrees higher than the top limit of regular polystyrene. Dow expects the newcomer to broaden the Styrons' field of application, believes it will be of particular interest to manufacturers of radio cabinets, battery cases, electrical coil forms, appliance knobs, etc.

•

New Boosters: Results of recent swine-feeding experiments at the University of Illinois show a compound of arsenic, 3-nitro-4-hyroxy phenylarsonic acid, to have growth-stimulating action. But, on the strength of the Illinois work, the substance doesn't come up to aureomycin or terramycin.

And what may prove to be a new vitamin was discovered at the U.S. Department of Agriculture's poultry nutrition laboratory (Beltsville, Md.). A concentrate prepared from fish solubles was found to contain a factor that promotes rapid growth in young chickens, even those receiving all known nutrients. Identity of the factor is still unknown, but fish solubles, fish meal and meat meal appear to be the only important sources among commonly used feedstuffs.

•

Easy Ride: Powdered, reclaimed rubber is softening auto rides for residents of Buffalo, N.Y. U.S. Rubber Reclaiming Co., Inc., has paved a 1,500-foot strip of one of the city's busiest streets with a mixture of asphalt and ground rubber. The Dutch are said to have started the idea, back in 1939. It has been tried here with new rubber, but never before with reclaimed material.

•

Educated Sniff: To test the effectiveness of chlorophyllin deodorants, Louis C. Barail, New York consulting chemist, has devised an osmometer which is reported to permit a trained technician to measure upwards of 300 intensities of odor.

But it's still agreed that the instrument hasn't been developed to rival the nose.

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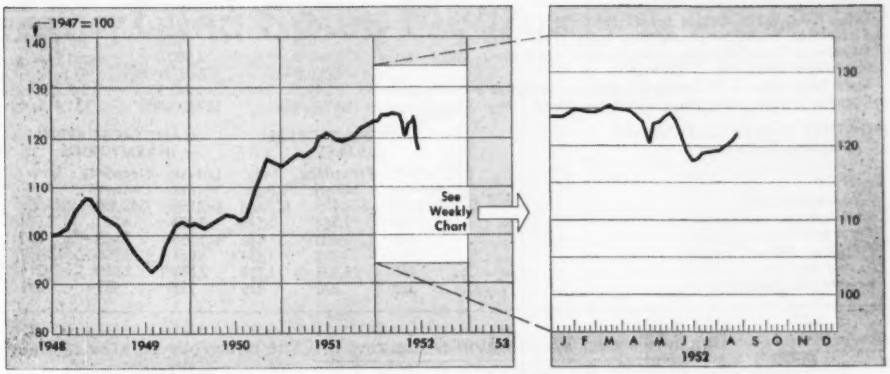
MARKETS . . . . . .



CW Index of Chemical Output—Basis: Total Man Hours Worked in Selected Chemical Industries

MARKET LETTER

Procrastinating anti-freeze users may get a break this winter, thanks to expanding glycol and methanol production. Late-season customers have often, in the past, found dealers' shelves bare—especially after the first cold snap.

The ever-growing anti-freeze market (an estimated 95-100 million gallons this year) will be satisfied out of record production of the two leading "winterizing" items—ethylene glycol (permanent), methanol (non-permanent).

Glycol output by year's end is expected to hit close to 750 million pounds; methanol, which takes care of about 87% of the non-permanent type anti-freeze demand, is now crowding the one and a quarter billion pounds a year mark.

The yes-no sulfur shortage disagreement waxes hotter. Two governmental moves on the sulfur stage last week have at least one producer gleefully saying "I told you so."

The National Production Authority moves:

- Lifting of distribution controls on sulfuric acid.
- Extending to 60 days, the 25-day limit on sulfur inventories.

The decontrol action on the acid (revocation of Order M-94), however, is clearly marked, figuratively speaking, with a large "Do Not Misconstrue" label. M-94, NPA points out, is merely a distribution order: Its revocation does not mean a sulfur shortage does not exist.

The other Agency action, easing the inventory limitation on sulfur (because above-ground stocks have improved), brought forth this statement from Freeport Sulphur Co.'s president Langbourne Williams, Jr.: "It (the action) is one more indication that the sulfur shortage of the last two years is virtually over . . . there is enough sulfur to meet all requirements."

A similar is-there-enough or isn't-there question seems to be popping up in the methylene chloride field. Some producers are puzzled that the government has not removed the item from its rapidly shrinking list of products requiring allocation authorization.

Prime requirements for "decontrol"—increasing supply, decreasing demand—are being, have been met since June, they say.

MARKET LETTER

WEEKLY BUSINESS INDICATORS	Latest Week	Preceding Week	Year Ago
CHEMICAL WEEK Output Index (1947=100)	121.8	121.5	120.0
CHEMICAL WEEK Wholesale Price Index (1947=100)	102.4	102.3	107.0
Bituminous Coal Production (daily average, 1,000 tons)	1,650.0	1,590.0	1,713.0
Steel Ingot Production (1,000 tons)	2,050.0	2,017.0 rev.	
Stock Price Index of 14 Chemical Companies (Standard & Poor's Corp.)	245.2	147.7	253.1
Chemical Process Industries Construction Awards (Eng. News-Record)	$8,363,000	$32,035,000	$31,418,000

MONTHLY INDICATORS—TRADE (Million Dollars)	MANUFACTURERS' SALES			MANUFACTURERS' INVENTORIES		
	Latest Month	Preceding Month	Year Ago	Latest Month	Preceding Month	Year Ago
All Manufacturing	$21,841	$23,105	$22,133	$42,096	$42,450	$39,009
Chemicals and allied products	1,508	1,564	1,543	3,058	3,031	2,771
Paper and allied products	608	608	686	1,059	1,069	887
Petroleum and coal products	1,962	1,908	1,884	2,564	2,506	2,420
Textile products	1,042	1,106	1,279	2,539	2,539	3,214
Leather and products	222	220	315	528	535	691

But here's why Washington is hanging on. The next four months will see critical needs for methylene chloride. It's a safe bet military and essential consumers will take a hefty chunk of available material.

"Decontrol" will not take place until after the first of the year.

There's no question, however, that synthetic detergent sales continue to bite into the soap market. Total soap sales (solid and liquid) for the first half of 1952 show a 14% decrease from sales of the same period in 1951, while synthetic detergents sales are up 17%.

The Association of American Soap & Glycerine Producers breaks down the poundage figures like this:

	First Six Months 1952	1951
Total soap sales	974 million	1,128 million
Total synthetic detergent sales	719 million	612 million

Although all glycerine consumers are not getting all they want all the time, the pinch has definitely eased. The reason: Shell Chemical's (Houston, Tex.) synthetic glycerine plant is back on full stream.

Some 4 million pounds a month from Shell's installation was hitting the market before the recent strike, and current production is expected to wipe out any "tightness" before long.

Glycerine prices remain steady for both saponification and refined grades: the former (crude) about 24¢ (pound); the latter, hovering around the 34½¢ level.

An easing-up in supply of phosphatic and potash fertilizers is behind the Office of International Trade action which places both items under "open-end" licensing for export for the year ending June 30, 1953.

Exports of both types of fertilizers previously were restricted to approximately the 1949-50 levels.

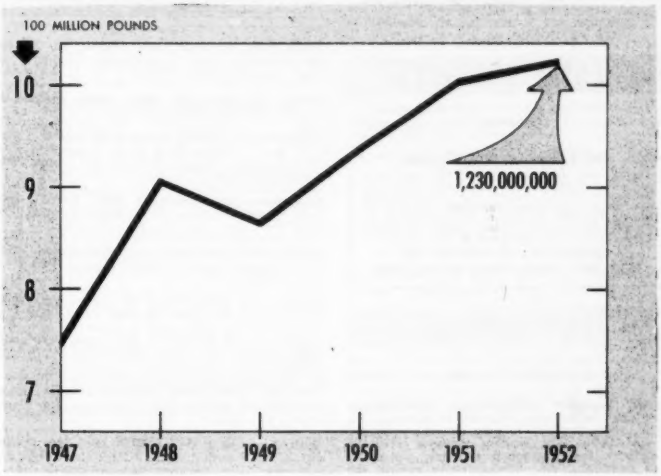
Substantial foreign copper imports, high level of industry-held stockpiles have taken the sting out of the threatened strike at Western copper mines. NPA copper experts are certain these cushions will absorb any sudden impact from a mine strike.

SELECTED CHEMICAL MARKET PRICE CHANGES—Week Ending August 25, 1952

	Change	New Price		Change	New Price
UP					
Casein, Argentine, 100-bgs or more	$ .0025	$ .1875	Cottonseed oil, crude, tks.	$ .0025	$ .1337
DOWN					
Molasses, blackstrap, feedgrade, tks., New Orleans	$ .005	$ .17	Oil, palm, clarif., drms.	$ .005	$ .1220

All prices per pound unless quantity is stated

Booming Oleo Sales Mean...



Hefty Raw Material Demand

This year's sales 1,230,000,000 lbs. (est.)

Will consume:

783,000,000 lbs.	Soybean Oil
36,000,000	Cottonseed Oil
211,000,000	Salt
15,990,000	Milk solids (proteins, sugars, minerals)
184,500,000	Skim milk or water to reconstitute powered milk
1,230,000	Sodium Benzoate
3,075,000	Lecithin*
6,150,000	Mono- and di-glycerides*
101,000	Vitamins (A and D)
27,000	Colors

* Found in all natural fatty compounds; amounts given included in oil figures.

Oleomargarine makers, this week are elated over sales which are running about 26% over the same period last year. Even with possible slackening off later in the year, the industry will hang up an all-time record with production of nearly a billion and a quarter pounds. And not a few allied chemical process industries are just as happy over this once dawdling, now booming golden market. For a large proportion of every pound of oleo made stems from CPI raw materials —e.g. hydrogenated oils, vitamins, colors, etc.

Soy Vs. Cottonseed: Soybean and cottonseed growers, and processors, of course, rank as top beneficiaries. They supply more than four-fifths of the margarine manufacturers' basic ingredients.

Margarine, at the moment, is taking about 20% of all the soybean oil produced in the U.S. and a slightly lower percentage of the cottonseed oil output. In the past few years soybean oil has outstripped cottonseed oil as the number one oleo material. As recently as 1949 the latter was preferred eight to five over the soybean product. But

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Technical Director, 12 years experience every type industrial adhesives. Thorough knowledge resins, emulsions, organosols, latices, dispersions, etc., and formulating methods plus field applications; also similar experience industrial finishes. Diversified and intensive technical sales service background. Will travel. Available in 4 months in N.Y., N.J. area. PW-5168, Chemical Week.

EQUIPMENT--used-surplus

For Sale

Autoclaves, Steel, Hor. 66"x14'7", First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

Bottling Machine used. Perfect condition adjustable to bottles various sizes—Rogols 153 McGrath Way, Somerville, Mass.

Calenders, New Rubber Calenders, 6x12", Johnson Joints, 7½ HP motor, Complete. Eagle Industries, 108 Washington St., NYC.

Centrifugal 36"x40", Bird, Continuous, Consolidated Products, 18 Park Row, N.Y. 38, N.Y.

Centrifugals, Bird 48"; Rub. Covered. First Machinery, 157 Hudson St., N.Y. 13, N.Y.

Dryer—Buflovak Double Drum all iron, 32" x 72" steam at 160 P.S.I. Includes rake agitated pan, side conveyors and fume hood. The Vulcan Detinning Co., Sewaren, N. J.

Dryer—Ruggles-Coles class XA—3' x 16' Combustion Chamber, Blower Dust Collector, Oil Burner & Controls. The Vulcan Detinning Co., Sewaren, N. J.

Dryer, Vacuum Shelf, 20 shelves, 59 x 78, pump, cond. (6). Consolid'd. Prod., 18 Pk. Row, N.Y. 38.

Dryers, 2 Blvk 32x90 dble. drum, SS accessories, comp. Eagle Industries, 108 Washington St., NYC.

Dryers, 2 Stainless Drums; 5'x10', First Machinery Corp., 157 Hudson St., N. Y. 13, N. Y.

Extractors—Fletcher—SS New 30" & 40" Equipment Clearing House, Inc. 289—10 St., Bklyn 15.

Filter Press, 18" x 18", Sperry, Iron, P & F, 11 chambers (20) Consolidated Products, 18 Park Row, N.Y. 38.

Filter Press, 30"x30", Iron, Sperry, steam heated, 10 chambers. Consolidated Products, 18 Park Row, N.Y. 38, N.Y., Barclay 7-0600.

Filter Press, 30" x 30", Aluminum, 45 Chambers. Consolidated Products, 18 Park Row, N.Y. 38.

For Sale

Filter Press, 42" x 42", Iron, Shriver, 18, 27, 36, 54 chambers (12). Consolidated Products, 18 Park Row, N.Y. 38.

Filters, all sizes and types. Perry Equipment, 1415 N. 6th St., Phila. 22, Pa.

Filters—Oliver Rotary Vacuum, all iron 8' x 12', 5'-3" x 4', 2 Lime Mud 3' x 4' complete with vacuum pumps, filtrate receivers and pumps. The Vulcan Detinning Co., Sewaren, N. J.

Granulator, Allis Chalmers, Ball, 4'6"x7', iron lined. Used 100 hours. Consolidated Products, 18 Park Row, New York 38, N.Y. BA 7-0600.

Kettle, Steel, Jacketed, agitated, closed, 650-1000 gallons, Queen Chemical Co., 57 Van Dam St., Brooklyn 22, N.Y.

Kettles, S/S, 300 gal. and 200 gal., 100#, W. P. Consolidated Products, 18 Park Row, N.Y. 38.

Labeler, World Model CH, press type, very good cond. Process Industries, 305 Powell St., Brooklyn 12, N.Y.

Mill, New Rubber Mills, 6x12, 6x14, 6x16"; Johnson Joints, Complete. Eagle Industries, 108 Washington St., NYC.

Mills, Raymond #5047 & 5057, High Side Roller, (2). Consolidated Prods., 18 Park Row, N.Y. 38.

Mills, Traylor tube, 5'x22', 5'x20', 4'6"x18'6", 4'x13', stone lined, pebble charge (4). Consolidated Products, 18 Park Row, New York 38, N.Y.

Mixer, Lab, BP Vacuum, 7½ gal. jktd, MD. Complete. Eagle Industries, 108 Washington St., NYC.

Mixers, 700 gal. Turbo, Simplex, jktd. (2). Consolidated Products, 18 Park Row, N.Y. 38.

Mixers, horiz. ribbon, 14'x7'6"x6', jktd. 450 cu. ft. (2). Consolid'd. Prod., 18 Pk. Row, N.Y. 38.

Pebble Mills; 8'x8', Porcelain lined. First Machinery Corp., 157 Hudson St., N.Y. 13, N.Y.

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Tanks, Alum, Pressure—330 and 480 gal. Perry Equipment, 1415 N. 6th St., Phila. 22, Pa.

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by this year approximately 600 million pounds more soybean oil than the crushed cottonseed derivative will be spread on America's bread, find its way into kitchens via butter's neck-and-neck rival.*

Tax Off, Color Booms: There have been two big reasons for skyrocketing margarine sales:

- Easing of government curbs.
- Legalization of "color" by 41 of the 48 States

Repeal (in 1950) of the 64-year old Federal tax of 10¢ a pound on colored margarine and the special license fees of $600 a year for producers, $480 for wholesalers, was the first major victory in the industry's long drive for equal treatment with other foods.

With the big obstacle of Federal hamstringing out of the way, the campaign (spearheaded by the National Margarine Manufacturers Association) shifted toward easing of restrictive state laws barring the sales of colored oleo. Food dealers and consumers, too, joined forces with NMMA; by this week have succeeded in "capturing" all but 7 States. Holdouts are: Vermont, Iowa, Montana, Washington, South Dakota and naturally, Wisconsin (The Dairy State as its auto licenses proudly proclaim).

South Dakota doesn't actually ban sales of colored oleo, but a 20¢ a pound levy on the yellow product effectively curbs sales.

Main dyes used to give margarine (and some butter) that "golden look" are FD&C Yellow No. 3 and FD&C Yellow No. 4. Both are certified by the U.S. Food & Drug Administration. One pioneer in the field of supplying color to the spread-industry, the Golden Churn Laboratories (St. Louis, Mo.), early in its experience anticipated the struggle between margarine and butter producers, neatly sidestepped by setting up an associated firm (the Dykem Company) to serve margarine makers, while it continues to sell to creameries.

For many years Dykem and another trail-blazer, National Aniline Division of Allied Chemical, were the only manufacturers of the basic yellow dyes. Today, most dyestuff companies turn out the basic colors, but not many are in the food-coloring business.

Tight Hand: The whole oleomargarine business operates under tight FDA Standards of Identity. These standards tell margarine manufacturers exactly what their product must contain.

The latest revised issue (out this month) boosts required Vitamin A content to 15,000 units per pound (was 9,000 but most oleo makers have been putting in 15,000 units for years). One important change in FDA's rules, however, is that it OK's use of synthetic Vitamin A. This switch will mean a newly-opened market for chemical companies like Pfizer, Merck, Distillation Products Industries (Div. Eastman Kodack Co.), Hoffman-La-Roche. Some of the more than thirty margarine makers are also enriching their particular product, adding 2,000 units of vitamin, D.

But adding health-giving vitamins is not the only "gimmick" used by margarine producers to speed the day when oleo will pass butter in sales. Some other extensively advertised attractions: Neat quarter-pound foil wrapped packages; "discount" coupons good for more oleo, eggs, other foods; addition of stabilizers to make the margarine spread smoothly when cold, prevent it from "running" on hot days.

With sales of margarine expected to top $350,000,000 this year, one thing is certain. Most anything the oleomargarine industry does to boost sales and production—at least some chemical process industries will be there to cheer.

* Latest USDA figures (issued last week) show butter-margarine production gap closing rapidly: 1947—butter, 1,300 million pounds vs. oleo, 745 million; 1951—butter, 1,465 million; oleo, 1,037 million pounds.

Government Needs

Bid Closing	Invitation No.	Quantity	Item
Chemical Corps, U. S. Army, New York Chemical Procurement District, 180 Varick St., N.Y. 13, N.Y.			
September 5	CML-30-070-53-5	92,240 lbs	Dye, Red, (for colored smoke mixtures), in accordance with Spec MIL-D-3718, March 20
September 5	CML-30-070-53-5	66,657 lbs	Dye, Green (for colored smoke mixtures), in accordance with Spec MIL-D-3709, March 4
September 5	CML-30-070-53-5	27,913 lbs	Auramine Hydrochloride (for colored smoke mixtures), in accordance with Spec MIL-A-3664, January 9
Chicago Quartermaster Depot, Quartermaster Purchasing Division, Chicago, Illinois			
September 8	53-63B	1,460,000 lbs	Shortening, canned, 5½ or 5 lb. can, spec. EE-S-321

Government Awards

Item	Amount	Dollar Value	Supplier, Location
General Stores Supply Office, 700 Robbins Avenue, Philadelphia 11, Pa.			
Glass, Fibrous, Tape	9,600,000 lin ft	105,984	Hope Webbing Co., Inc., 1005 Main St., Pawtucket, R.I.

BOOKLETS

Chemicals

Silicone Fluid

32-p. booklet "Dow Corning 200 Fluids" describes uses and properties of liquid methyl silicones in wide viscosity ranges. References and a blending chart for intermediate viscosities are included, as well as current industrial applications. Dow Corning Corp., Midland, Mich.

Dibutyl Phthalate

2-p. technical report describes uses and properties of dibutyl phthalate, chiefly as a plasticizer for nitrocellulose lacquers, and also in polystyrene and other rubbers, and alkyd and plasticizing type synthetic resins. Request Technical Service Report E-4, Witco Chemical Co., 295 Madison Ave., New York 17, N.Y.

Peroxygen Seed Treatment

8-p. bulletin discusses potentialities of peroxygen chemicals in the field of seed treatment. Some of the subjects treated: removal of seed coat with hydrogen peroxide, germination of barley, and others. Request bulletin No. 33, Becco Sales Corp., Station B, Buffalo 7, N.Y.

Equipment

Thermocouple Wires

2-p. bulletin introduces three new thermocouple wires for use at temperatures varying from minus 20 to plus 2000 degrees. Engineering data and representative applications for each are listed. Bulletin 5600, Station 213, Minneapolis-Honeywell Regulator Co., Wayne and Windrim Aves., Philadelphia 44, Pa.

Vibration Meter

4-p. bulletin describes the 1-110B vibration meter, which gives direct readings of both linear and torsional velocity and displacement. Complete information and specifications are given. Bulletin CEC 1505B, Consolidated Engineering Corp., 300 N. Sierra Madre Villa, Pasadena 8, Calif.

Induction Motors

6-p. folder describes large wound-rotor and squirrel-cage polyphase induction motors. Special designs of high-horsepower motors are illustrated. Bulletin 37-200, The Electric Products Co., 1725 Clarkstone Rd., Cleveland 12, O.

Turbidity Recorder

2-p. bulletin covers the Turbidity Recorder TR-6 for measuring the amount of light cut off by undissolved substances suspended in fluids. Pertinent information and technical sketches are included. Request bulletin No. 604, Ess Instrument Co., Bergenfield, N.J.

Drying Units

4-p. booklet pictures and describes the Standard-Hersey Model D and DW Steam Jacketed Cooking and Drying Units, of special use for drying large amounts of garbage. Other applications and operation principles are described. Standard Steel Corp., 5001 S. Boyle Ave., Los Angeles 58, Calif.

Calculating Punch

6-p. folder describes new calculating punch which makes possible the addition, multiplication, and subtraction of values retained in the storage unit, or of values transferred from the tabulating card. Booklet No. TM809, Remington Rand Inc., 315 Fourth Ave., New York 10, N.Y.

Synchronizer

24-p. booklet entitled "Synchronizer" is a quarterly publication dealing with the application of A-C motors to centrifugal refrigeration compressors. Refrigerant characteristics, compressor capacity control, motor characteristics, and motor control are discussed. Other feature articles include "The Line Diagram" and "How to Select Control for Wound-Rotor Motors." Charts of engineering information are included. Request E-M Synchronizer 36, Electric Machinery Manufacturing Co., Minneapolis 13, Minn.

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Acetamide		●	●										●			●					
Acid Fluoboric	●	●		●			●	●	●	●	●	●			●						
Acid Hydrofluoric, Reagent		●		●			●			●	●										
Alkali Fluoborates							●	●		●	●										
Aluminum Chloride, Solution		●	●			●	●		●	●	●	●	●	●		●	●	●	●	●	
Aluminum Fluoride, Crystal		●								●		●		●							
Aluminum Nitrate		●		●							●								●		
Ammonium Acetate						●				●		●		●				●	●		
Ammonium Oxalate			●		●				●	●			●	●			●	●			
Ammonium Sulfate Purified and Reagent A.C.S.	●	●				●	●		●	●				●		●	●				
Ammonium Thiosulfate				●					●	●				●	●				●		
Boron Trifluoride Gas and Various Complexes		●								●	●	●	●	●		●		●		●	
Cadmium Nitrate	●	●		●			●					●	●			●					
Calcium Acetate Purified and Reagent		●				●							●	●		●		●	●		
Calcium Chloride, Anhydrous Purified and Reagent A.C.S.				●		●										●					
Calcium Phosphide					●						●										
Chlorine Trifluoride		●														●					
Chromium Fluoride		●	●							●			●							●	
Chromium Nitrate		●														●					
Chromium Potassium Sulfate (Chrome Alum)		●	●						●					●	●		●			●	
Cupric Nitrate		●	●		●			●		●					●					●	
Cuprous Chloride	●	●	●		●						●	●	●	●		●				●	
Ferric Nitrate			●						●											●	
Ferrous Ammonium Sulfate		●	●							●								●			
Lead Nitrate		●	●		●				●		●	●	●	●	●		●		●	●	
Metal Fluoborates										●						●					
Oxamide					●																
Potassium Acetate		●		●					●	●				●		●	●			●	
Potassium Bifluoride		●		●			●			●										●	
Potassium Borate, Tetra										●											
Potassium Fluoride		●								●											
Potassium Nitrite		●	●			●				●		●						●	●		
Potassium Permanganate																					●
Potassium Titanium Fluoride											●							●			
Sodium Bisulfite, Meta Purified and Reagent						●								●						●	
Sodium Fluoride, Reagent A.C.S.								●					●								
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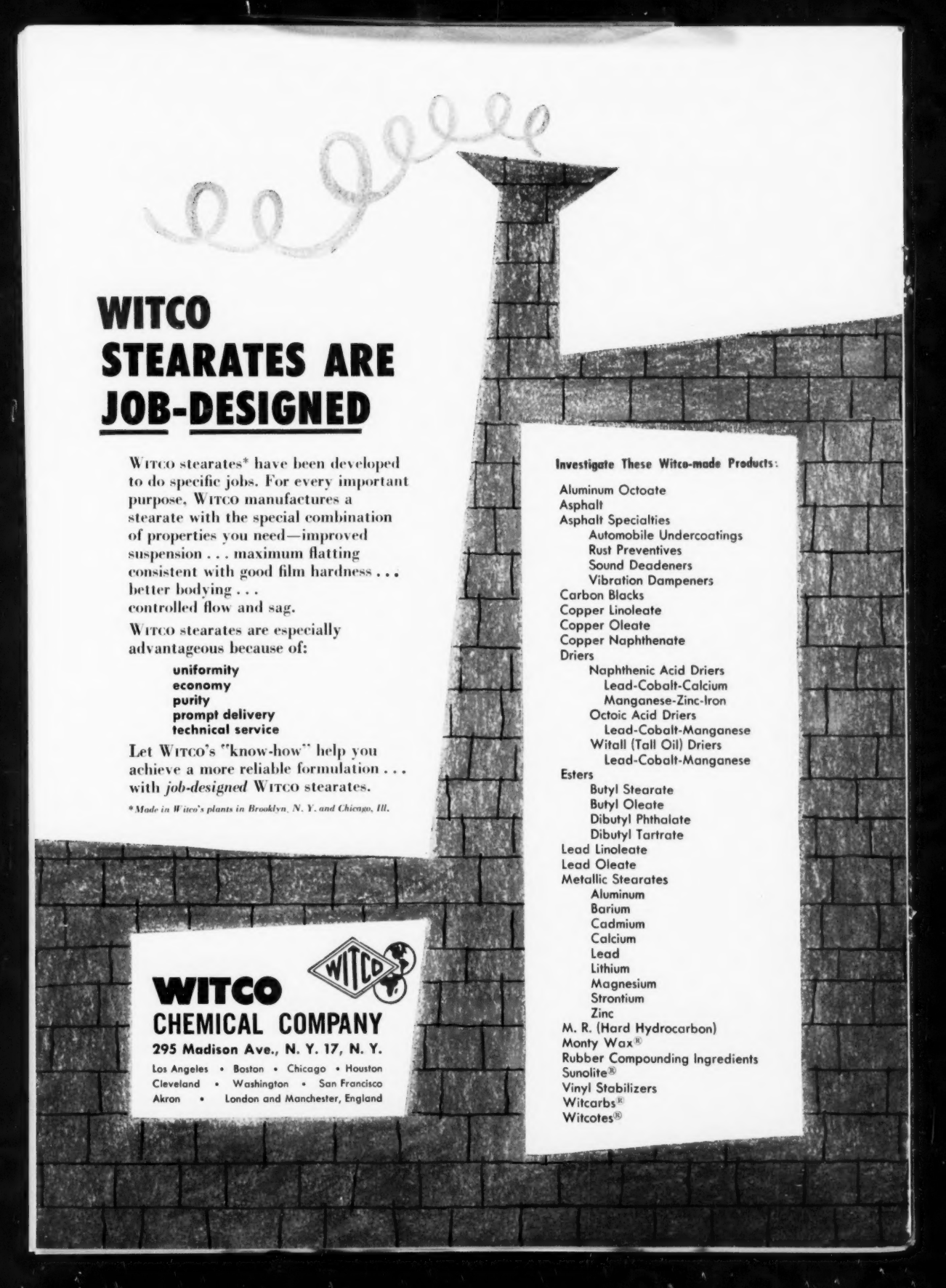

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